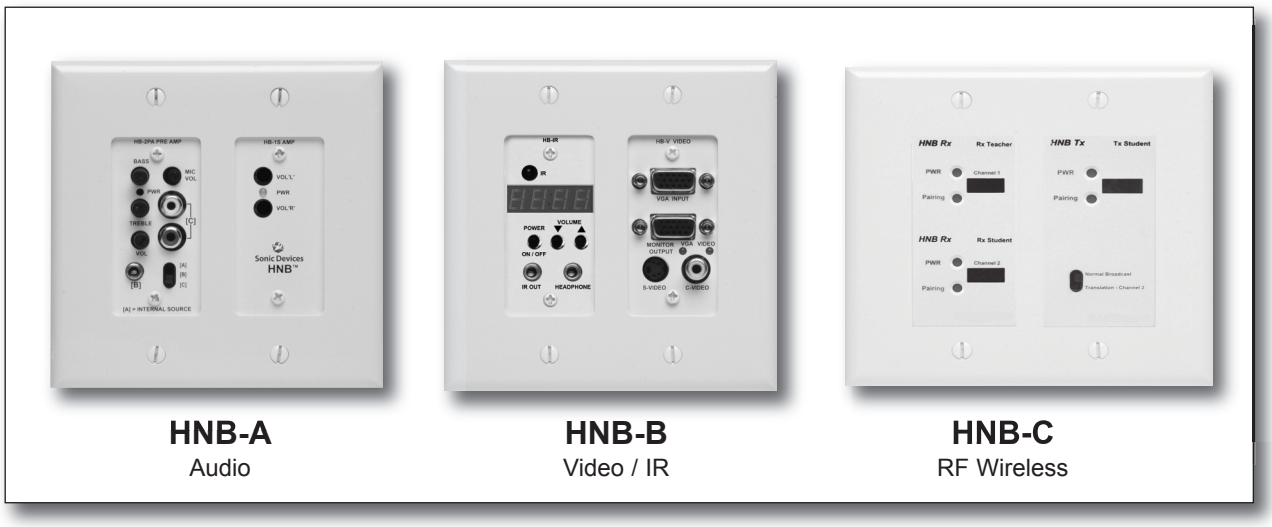
Sonic Devices

Installation and Technical Application Guide

HNB-A, HNB-B and HNB-C



HNB-A
Audio

HNB-B
Video / IR

HNB-C
RF Wireless

HNB™ Modular Multimedia Systems
*Digital Audio, Video and **RF** wireless*

Teacher shown wearing
HNB-C System RF wireless
microphone Model TM3

System shown includes
HNB-A + HNB-B + HNB-C installed in a 6-gang configuration

HNB™: PATENT PENDING

SonicDevices ■ 9950 Baldwin Place, El Monte CA 91731 ■ (T) 626-454-8169 ■ (F) 626-433-1079 ■ (W) www.sonicdevices.net

IMPORTANT SAFETY INSTRUCTIONS

WARNING
CLASS 2 WIRING MUST BE USED.

Make all wiring connections prior to AC connection and power up.

WARNING:

To reduce the risk of fire or electric shock, do not expose this device to rain or moisture. Device shall not be exposed to dripping or splashing and no objects filled with liquids, such as glasses or vases, shall be placed on the device.

WARNING FOR YOUR PROTECTION PLEASE READ THE FOLLOWING:

1) Read these instructions.
2) Keep these instructions.
3) Heed all warnings
4) Follow all instructions.
5) Do not use this device near water.
6) Clean only with a dry cloth.
7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8) Do not install near any heat sources such as radiators, heat registers, stoves, or other devices (including amplifiers) that produce heat.
9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the device.
11) Only use attachments/accessories which are provided or specified by the manufacturer. System requires; UL listed Class 2, EPBU category power supply rated at 24VDC / 2.5A (provided).
12) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the device, the device has been exposed to rain or moisture, does not operate normally, or has been dropped.

IMPORTANT NOTICES

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Installation Guide	SAN-HNB-ABC-001
Device models	HNB-A, HNB-B, HNB-C (C1, C2, C3) Modular Digital multimedia mixer for Audio, Video and Wireless
1st Edition	May, 2010

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We appreciate all comments which may improve or enhance the understanding and use of this product by the installer and or end user and ask that all communication regarding this publication be directed to:

SonicDevices
9950 Baldwin Place
El Monte, CA. 91731
Tel: 626-454-8169, Fax 626-433-1079
www.sonicdevices.net
email: tom@sonicdevices.net

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Check Carton Contents:

HNB-A
Audio Amplifier / Preamplifier
(stand-alone AUDIO system)

Contains the following:
- HNB-A metal 2-gang chassis with backplane
- 2-gang Decora-style wall plate
- Plug-in pre-amplifier card (HB-2PA)
- Plug-in amplifier card stereo/mono (HB-1S)
- 24VDC/2.5A power supply
- Assorted plug-in connectors and hardware

HNB-B
Video / IR Control

Contains the following:
- HNB-B metal 2-gang chassis with backplane
- 2-gang Decora-style wall plate
- Plug-in IR receive card (HB-IR)
- Plug-in video transmit card (HB-VTx)
- Video receiver box (HB-VRx)
- Hand-held IR remote control
- Assorted plug-in connectors and hardware

Package requires equal quantity HNB-A

HNB-C
RF Wireless
Receive and Transmit

Contains the following:
- HNB-C metal 2-gang chassis with backplane
- 2-gang Decora-style wall plate
- Receiver card (HB-Rx)
- Transmitter card (HB-Tx)
- Teacher Microphone w transmitter (TM2)
- Student hand-held microphone with charger stand (SM-1)
- Assisted Listening receiver with headphones (HB-RU)
- 2 Belt clips with lanyard
- 2 Battery Charger 6v power supplies
- 6-32 mounting screws (x4)

Package requires equal quantity HNB-A

HNB-C1 / C2 / C3
RF Wireless
Receive

Contains the following:
- HNB-C metal 2-gang chassis with backplane
- 2-gang Decora-style wall plate
- Receiver card (HB-Rx)
- Teacher Microphone (TM1, TM2 or TM3)
- Student hand-held microphone with charger stand (SM-1)
- 1 Belt clip with lanyard
- 1 Battery Charger 6v power supply
- 6-32 mounting screws (x4)

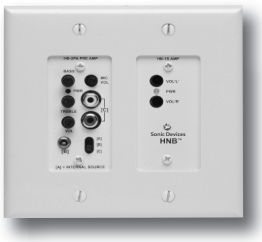
Package requires equal quantity HNB-A

Sonic Devices

Installation and Technical Application Guide

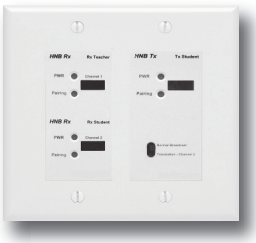
HNB™ Digital multimedia mixer for Audio, Video and Wireless applications

SECTION 1.0 - HNB-A + HNB-B + HNB-C INTRODUCTION AND APPLICATIONS



HNB-A
Audio

HNB-B
Video-IR
(with power supply)



HNB-C
RF Wireless
(Receive &Ttransmit)

HNB-C1* / C2* / C3*
RF Wireless
(Receive)
*The difference between C1, C2 and C3 is microphone style

Each HNB system:
•is 2-gang and includes a 2-gang wall plate.
•may be installed into any combination of 2, 3, 4, 5, 6-gang electrical boxes that are 3.5" DEEP.
•connects via CAT5e UTP cable.
•may be installed up to 100 feet apart.

The HNB-A, HNB-B and HNB-C systems are capable of supporting numerous A/V applications, including but not limited to: ***ALL EDUCATION*** *classrooms,* ***CORPORATE*** *boardrooms, conference rooms, break-out areas, briefing centers, lobbies, private offices,* ***ENTERTAINMENT*** *theater backstage dressing rooms, green rooms, practice rooms, stadium skyboxes, concession stands,* ***RETAIL*** *stores, restaurants and salons,* ***HOSPITALITY*** *rooms,* ***CHURCH*** *multi-use, overflow areas,* ***HEALTHCARE*** *surgery or recovery, lobbies, doctors offices, administration areas and wherever a complete multimedia communication package integrating audio, video and wireless technologies is desired.*

The HNB™ concept:

The HNB system is flexible, easy-to-install, use, upgrade and maintain. The patent pending technology provides an extremely cost effective solution for any room requiring integration of audio, video and wireless 'Soundfield' amplification. HNB supports a wide range of Audio and A/V applications with built-in compatibility to laptops, desktop computers, A/V projectors, VCR, DVD, DVR, iPOD, MP3, and microphone input sources for use in teaching and training environments. The HNB system is a common sense 'purpose built' solution for universities, colleges, K-12 schools and corporate training facilities.

In addition to A/V application support, the HNB system unifies all major emergency communications systems into a comprehensive and seamless solution to meet everyday needs. HNB is simple in its design and operation integrating advanced technologies providing immediate benefit to Consultants, Contractors and End-users.

The HNB™ building blocks: A + B + C:

The HNB system is based on a simple premise of 'hang and bang' = Simple, Fast, Affordable, Reliable and Secure. From the ground-up HNB starts by using the most common device found throughout all building types in North America – the common NEMA/UL rated electrical gang box. HNB takes up no space in the room, is totally secure while using the most inexpensive and widely available mounting option in the market. HNB is a modular 'plug and play' system integrating the most basic media room elements of Audio (A) + Video (B) + Wireless (C) which interconnect via standard CAT5e UTP cable. The HNB system always starts with the 'A' package (HNB-A) providing a 2-gang modular AUDIO system with an Amplifier and Preamp in addition to key I/O interconnections to vital emergency communication systems including; PA and Intercom (1v-70v), Archival or Recording systems, ancillary power amplifiers or 'control' audio systems. HNB-A is provided with a UL Class 2 low voltage 24VDC/2.5A power supply capable of powering HNB-A, B and C units via the CAT5e wiring between them.

If VIDEO is required and/or IR control is desired add the HNB-B unit. This additional 2-gang unit provides transmission of VGA/RGB, S-video, Composite video signals while providing a buffered VGA Monitor output. Video transmit and receive are accomplished via a single CAT5e UTP cable up to 150 feet to the AV Projector.

If WIRELESS 'Soundfield' teacher amplification or ADA ASSISTED LISTENING (hard of hearing) and or simultaneous 2nd language TRANSLATION is important to improve the education experience for Teachers, Students, Parents and the Community then add HNB-C. The RF Wireless HNB-C can be added at anytime to HNB -A or HNB A + B depending on your room requirements. HNB-C is an RF based system providing up to two (2) channels of simultaneous transmit and two (2) channels of receive signals to headsets, hand-held microphones, and headphones which can be IR paired to any HNB-C equipped room in less than ten (10) seconds! HNB-C 'RF' technology is IMMUNE from all LIGHT sources and room architecture. It is not limited by LINE-OF-SIGHT restrictions and provides total coverage in every square foot in the room. Users have full mobility and freedom of movement achieving complete confidence that important instruction will be heard.

1.1 HNB-A: AUDIO system

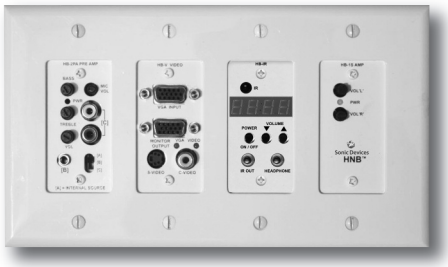
HNB-A

Included Accessory - HNB-A
HB-PS power supply

HNB-A Contents:
(1) HNB-2-gang metal chassis
(1) 2-gang Decora white wall plate
(1) HB-2PA Preamp card
(1) HB-1S Digital amp card
(1) HB-PS Power supply 24VDC/2.5A

Basic Capabilities
HNB-A
- Fits standard 3.5” deep 2-gang electrical box or 4-gang, 6-gang for expansion of HNB ‘B’ and ‘C’ units.
- (3) Audio inputs switchable (RCA, 3.5mm, Phoenix)
- Dual channel Class D digital amp for mono or stereo operation.
- Interface to microphone system (wired or wireless).
- Override interface to emergency systems (EAO–1 / Emergency Audio Off).
- Override interface to intercom – PA system, 1V – 70V, (MO).
- Audio line output to record or connect to ancillary audio power system.
- Power 4-8 ohm speakers or 25-70V speakers with optional HNB-70V2X.
- CAT5e UTP interface to expansion HNB-B (Video/IR) or HNB-C (RF Wireless) units.
- 24VDC/2.5A UL-CUL wall power supply / Class 2 low-voltage / Energy Star Rated.

1.2 HNB-A + HNB-B: AUDIO + VIDEO + IR system



HNB-A + HNB-B
shown with 4-gang wall plate (by others)
2-gang wall plates are included

Included Accessories - HNB-A + HNB-B

HB-PS	HB-VRx	HB-IRRC
Power Supply	Video Receiver	Remote

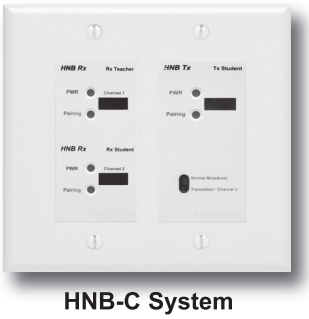
HNB-A Contents:
(1) HNB-2-gang metal chassis
(1) 2-gang Decora white wall plate
(1) HB-2PA Preamp card
(1) HB-1S Digital amp card
(1) HB-PS Power supply 24VDC/2.5A

HNB-B Contents:
(1) HNB-2-gang metal chassis
(1) 2-gang Decora white wall plate
(1) HB-VTx Video card VGA, S-video + C-video
(1) HB-VRx Video receiver
(1) HB-IR ‘IR’ Control card
(1) HB-IRRC Hand-held IR remote control

Basic Capabilities
HNB-A
- See above

HNB-B
- Interface with HNB-A unit via RJ45/CAT5e UTP cable.
- Video inputs (VGA, S-video, Composite video)
- Video transmission via single CAT5e UTP cable up to 150 feet.
- VGA buffered monitor output.
- RJ45/CAT5e UTP connection to remote video receiver with discrete output cables (VGA, S-video, composite video).
- IR remote control with LED extender (On/Off, Volume +/-, Bass/Treble, Balance, Mute).
- Visual status LED's for Power and Video.

1.3 HNB-C: RF WIRELESS System with Receive and Transmit Capability (requires HNB-A)



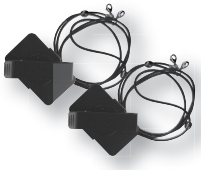
HNB-C System
RF Wireless Receive & Transmit

TM2
Teacher Mic
w transmitter

SM1
Student Mic
w charger stand

HB-RU
Receiver
w headphones

Power supplies



Belt clips & lanyards

HNB-C Contents:
(1) HNB-C 2-gang metal chassis
(1) 2-gang Decora white wallplate
(1) HB-Rx Receiver card
(1) HB-Tx Transmitter card
(1) TM2 Teacher Microphone with transmitter.
(1) SM1 Student hand-held microphone with charger stand
(1) HB-RU Assisted Listening receiver with headphones
(2) Accessory Belt clips with lanyards
(2) Accessory Battery Chargers w 6v UL / Energy Star rated power supply
(4) 6-32 mounting screws

Basic Capabilities - HNB-C

- Utilizes "RF" wireless technology for dual channel simultaneous operation throughout 40' x 40' x 10' (typical) space. NO drop outs due to light or line-of-sight issues.
- Technology capable of supporting an UNLIMITED number of rooms per campus without interference.
- IMMUNE to LIGHT or room architecture assuring use throughout entire room.
- IMMUNE to Line-of-Sight operation assuring total mobility and freedom of movement for all users (Broadcast or Assisted Listening operation).
- Simultaneous broadcast of two (x2) independent channels: Teacher + Student, for collaborative teaching.
- Assisted Listening user selectable channel selection with adjustable volume controls.
- Simultaneous Assisted Listening for all audio to an UNLIMITED number of users.
- Simple and secure IrDA 'PAIRING' in under ten (10) seconds for ALL microphones and receivers for use in any room on any campus with visual LED status confirmation.
- Link and Re-Link ALL microphones and receivers in 1-2 seconds.
- FAST 100% RECHARGE of ALL microphones and receivers in under (90) minutes using UL / Energy Star rated battery charger with 6v wall power supplies included.
- GSM and CDMA filters to avoid interference with cell phone users in the room.
- Comfortable and ultra lightweight microphones, transmitters and receivers insure ease of use and comfort to Teachers, Students, Administrators, Guests.
- Mono and Stereo operation for Assisted Listening receivers (HB-RU) with common 3.5mm input compatible with user-provided headphones or headphones included with HB-RU.
- Wireless audio design integrated with Audio and Video systems (HNB-A, HNB-B) for simple install via CAT5e cabling and assurance of speech intelligibility.
- Fits 2-gang standard EO box with single CAT5e cable for cost-effective installation.

1.4 HNB-C: RF WIRELESS System with Receive Capability (requires HNB-A)

HNB-C2 System
RF Wireless Receive
(Difference between C1, C2 and C3 is the teacher microphone)

TM2
Teacher Mic
w transmitter

SM1
Student Mic
w charger stand

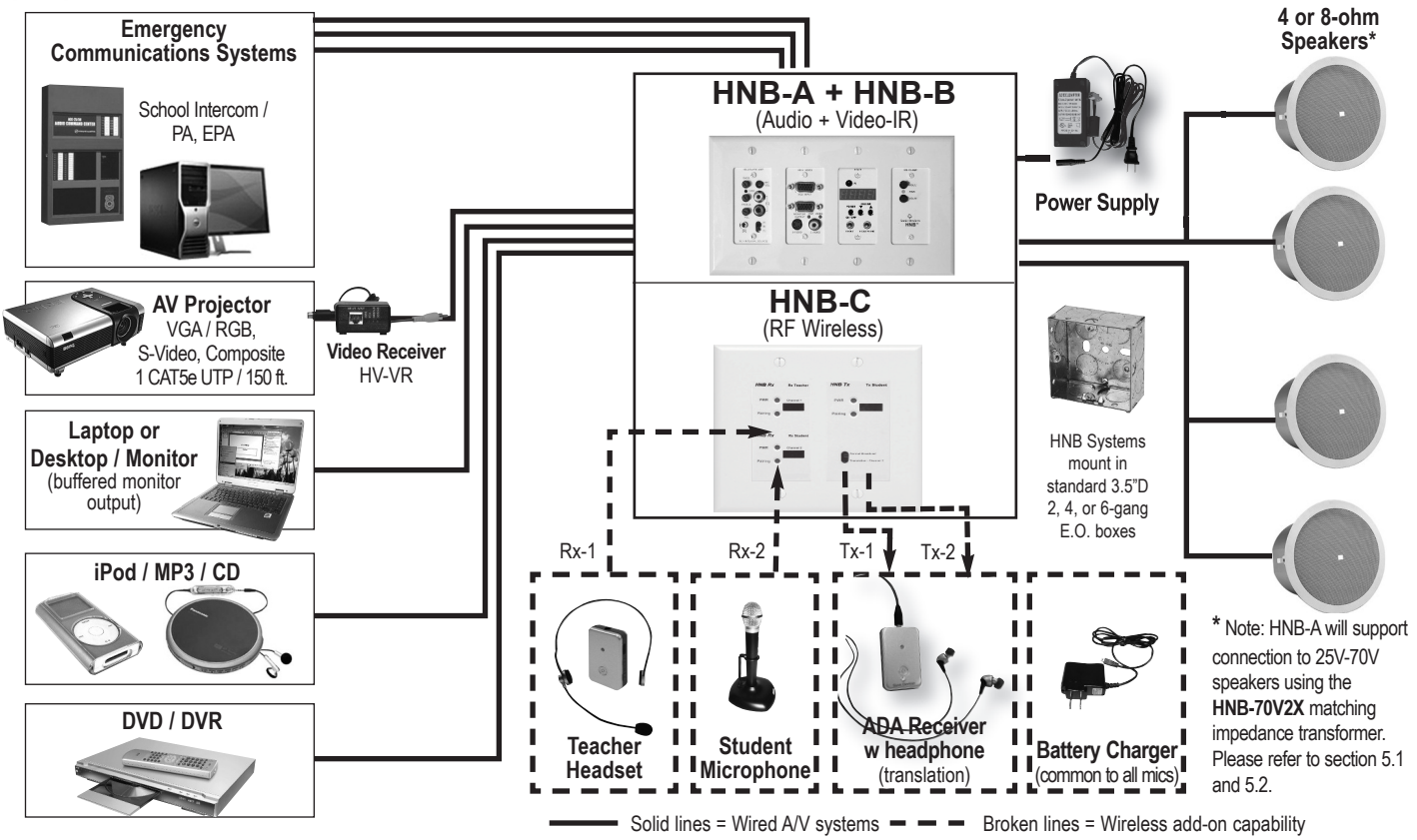
Belt clip,
lanyard &
power supply

HNB-C1 / C2 / C3 Contents:
(1) HNB-C 2-gang metal chassis
(1) 2-gang Decora white wallplate
(1) HB-Rx Receiver card
(1) Decora Blank white plate
(1) Teacher Microphone:
HNB-C1 includes TM1,
HNB-C2 includes TM2 w transmitter
HNB-C3 includes TM3 w transmitter
(1) SM1 Student hand-held microphone with charger stand
(1) Accessory Belt clip with lanyard
(2) Accessory Battery Chargers w 6v UL / Energy Star rated power supply
(4) 6-32 mounting screws

Basic Capabilities - HNB-C1, HNBC-2, HNB-C3

- Same as HNB-C without Transmiter card and transmit capability.

1.5 HNB Classroom Application: HNB-A + HNB-B + HNB-C (AUDIO + VIDEO-IR + RF WIRELESS)


Emergency Communications Systems
School Intercom / PA, EPA
AV Projector
VGA / RGB, S-Video, Composite
1 CAT5e UTP / 150 ft.
Video Receiver
HV-VR
Laptop or Desktop / Monitor
(buffered monitor output)
iPod / MP3 / CD
DVD / DVR
HNB-A + HNB-B
(Audio + Video-IR)
HNB-C
(RF Wireless)
Power Supply
4 or 8-ohm Speakers*
HNB Systems mount in standard 3.5"D 2, 4, or 6-gang E.O. boxes
Rx-1
Rx-2
Tx-1
Tx-2
Teacher Headset
Student Microphone
ADA Receiver w headphone (translation)
Battery Charger (common to all mics)
* Note: HNB-A will support connection to 25V-70V speakers using the HNB-70V2X matching impedance transformer. Please refer to section 5.1 and 5.2.
Solid lines = Wired A/V systems
Broken lines = Wireless add-on capability

1.6 HNB Competitive Feature Comparison HNB-A + HNB-B + HNB-C (AUDIO + VIDEO-IR + RF WIRELESS)

Manufacturer	**Sonic Devices HNB** A+B+C	Audio Enhancement Ultimate II	Lightspeed 880iR	Teach Logic Spectrum	Front Row Pro	Bogen Enhancer
Amplifier power	**50W**	72W	72W	40W	40W	35-65W
Wireless technology (HNB-C)	**RF**	IR	IR	IR	IR	IR
Requires body pack wires with batteries	**No**	Yes	Yes	Yes	Yes	Yes
Secure in-wall, surface or in-ceiling mount (EO/J-box compatible)	**YES**	No	No	No	No	No
IR Headset (Tx) / Headphone (Rx) pairing	**YES**	No	No	No	No	No
ADA transmit with receive headphones (2 channels)	**YES**	No	No	No	No	No
Wireless channels per system (Rx + Tx)	**4**	2	2	2	2	2
Video inputs to projector	**YES**	No	No	No	No	No
EAO-1 'Emergency Audio Off' override	**YES**	No	No	No	No	No
Intercom / paging override 1V-70V	**YES**	No	No	Yes	No	No
Number of audio inputs	**4**	3	4	3	2	3
Audio line out - record, podcast, larger system	**YES**	No	No	Yes	No	No
Headset mobility 'PAIR' to any room / any channel	**YES**	No	No	No	No	No
Simultaneous translation - 2nd language	**YES**	No	No	No	No	No
Plug-in options upgrade	**YES**	No	No	No	No	No
Stereo / mono operation	**YES**	Yes	Yes	Yes	Yes	Yes
EMI-RFI protection	**YES**	No	No	No	No	No
Works with 'HAC' hearing aid compatible headsets (FCC)	**YES**	No	No	No	No	No
Remote IR audio control	**YES**	No	No	No	No	No
Video input types	**VGA, S, Composite**	None	None	None	None	None
VGA/RGB output to desktop monitor	**YES**	No	No	No	No	No
USB mini jack battery charger interface / power from computer	**YES**	No	No	No	No	No
Battery type	**Lithium polymer + NiMH AA**	NiMH AA	NiMH AA	NiMH AA	NiMH AA	NiMH AA
Battery charger - recharge time (full charge headset)	**100 minutes MAX.**	12 hrs	10 hrs	3 hrs	6 hrs	8 hrs
Battery charger UL / DOE / EPA Energy Star Rated	**YES**	No	No	No	Yes	No

SECTION 2.0 - HNB-A + HNB-B + HNB-C OVERVIEW

2.1 HNB-A, HNB-B and HNB-C Series Technical Specifications

Type
2 Channel Mixer Amplifier
Architecture
Digital Class-D amplifier, Microcontroller

Mains Input Power
100-240VAC, 50-60Hz / Energy Star Rated
Input Power (to HNB™)
24VDC/2.5A regulated switching wall supply, UL1310 Class 2, Energy Star, FCC, CUL, CE listed (provided).
Output Power (from HNB™)
25W Peak 4Ω per channel 12W RMS continuous 4Ω per channel.

Audio Performance (HNB-A)
Frequency Response: 20Hz - 20kHz (± 1.5dB)
THD + N: ≤ 1.0% at 1kHz rated output, ≤ 0.1% at 1kHz at 10W 4Ω
Signal to Noise Ratio: 90dB A-weighted (band pass: 20Hz-20kHz)
Channel Separation: 60dB
Dynamic Range: 100dB
Input Sensitivity & Impedance: Program: 0.775V, 10kΩ electronically balanced, with RF filter (ferrite).
Outputs (R + L): 4Ω (optimum) or 8Ω, 25V /70V with optional transformer model HNB-70V2X.
Output Regulation Controls:
- Less than 2dB, no load to full load at 1kHz.
- Master Override (MO) audio level 0-1V POT.
- Master Override (MO) voltage sensitivity 1V-70V POT.
- Master Override (MO) delay (time sec) POT.
- Volume gain POTS on Preamp and Amp.
- Treble and bass POT.
- Power On/Off soft push button.
- Manual 'Duck' (1 to -50dB) for Mic input.

Controls-IR Remote (HB-IR, HB-IRRC):
- Volume (+/-, R+L), Mute, Balance (R+L), On/Off
- Redundant manual soft push buttons.
- HB-IRRC provided with (2) AA batteries.

Video Performance (HNB-B): HB-VTx, HB-VRx
- Supports VGA, SVGA, XGA , WXGA computer video to VESA standard.
- Supports NTSC, PAL and SECAM video standards.
- Output transmission via CAT5e meeting ANSI /EIA / TIA 568B standard.
- Operational bandwidth up to 350MHz.
- Horizontal frequency 15-126 kHz.
- Vertical frequency 43-200 Hz.
- Sync signal compatible with TTL level 5V / 3.3V.
- Power at 5VDC nominal from 24VDC/2.5A wall supply (HNB-A).
- Video differential gain / phase at +/- 2%.
- Attenuation loss rated at 6 dB at 1,000 feet at 1MHz typical UTP CAT5e.
- Maximum capacitance at 20 pf / foot UTP.

RF Wireless Receive/ Transmit Performance (HNB-C): HB-Rx, HB-Tx
- (2) RF Receive channels with automatic 'secure link' selection.
- RF antenna coverage 40 foot radius / 80 foot diameter nominal X-Y-Z axis.
- RF Frequency hopping modulation in 2.4GHz and 2.5GHz ISM band.
- 802.11 WiFi interference protection.
- GSM / CDMA cell phone interference immune.
- RF data transmit speed up to 2Mps with audio latency delay <2msec.
- Signal-to-Noise >55dB.
- Sensitivity >80dBm.
- Audio Frequency 200Hz to 8KHz @ 16k sample rate 16 bit resolution.
- Audio Distortion THD <1% at 1KHz.
- Mono or Stereo operation with HNB-A (HB-RU receivers/headphones).
- Visual status LED's (Blue / Red).
- Soft push button channel On / Off.

(continued in next column)

- IrDA secure pairing to Headset, Microphone, Headphone in < 10 seconds.
- Manual front switch option (HB-Tx) for 2nd language translation (Channel 2).
- FCC Part 15 Class B.
- Rechargeable batteries are Lithium Ion Polymer and NiMH capable of 1000+ charges, 100% Fast recharge in (90) minutes typical, 50% charge in (30) minutes.
- Battery chargers with 6v wall power supply are UL / Energy Star rated.

Power Efficiency
<80% at 25W 4Ω, <85% @ 8Ω, <90% at 10W 4Ω, <95% @ 8Ω
Power Consumption
32W / 9.5 btu @ 120VAC, 130ma nominal in 'Sleep' mode.
Operating Temperature
-10° to 40°C, 14 to 104°F
Storage Temperature
-20° to 65°C, -4 to 149°F

Input Connections
(3) Stereo/Mono inputs: 3-pin dockable, RCA and 3.5mm jack.
(1) 3-pin dockable Mic or Audio line level (Stereo/Mono).
(1) 2-pin dockable EAO-1 Emergency Audio Off override closure (no polarity).
(1) 2-pin dockable MO override input (+/-).
(1) HD-15 VGA/RGB (HB-VTx).
(1) 4-pin Mini DIN S-video (HB-VTx).
(1) RCA Composite video (HB-VTx).

Output Connections
(2) 2-pin dockable Speaker (R+L).
(1) 3-pin dockable Audio line out (1V/600 Ohm).
(1) RJ45 video out (HB-VTx) and video input (HB-VRx).
(3) RJ45 Audio/Power input and output between HNB-A + B.
(1) IR LED remote 3.5mm jack (HB-IR).
(1) Headphone 3.5mm jack (HB-IR).
(1) HD-15 VGA/RGB, (1) Mini DIN S-video, (1) RCA C-video all with 12"+ cables (HB-VRx).
(1) HD-15 VGA buffered Monitor (HB-VTx).

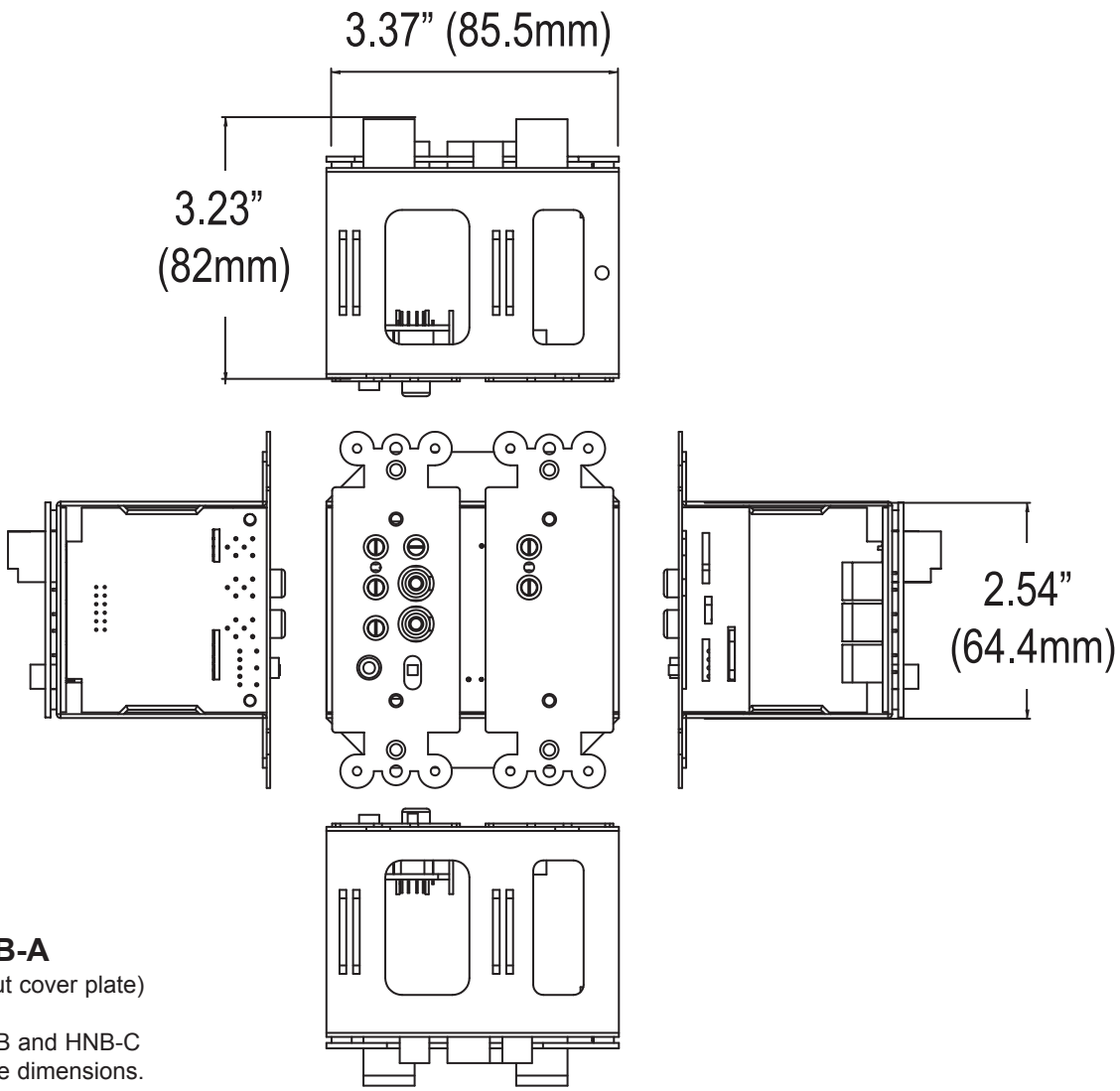
Internal Connections
(2) 2x6 socket connectors (HNB-A, B, C backplane).
(2) 3-pin header/jumper option (HNB-A backplane).

Visual Indicators
- Front LED video source active (green).
- Power LED for all plug-in modules (green).
- Internal LED for MO active (amber).
- Internal LEDs for power to each channel (green).
- Video signal present LEDs: VGA, S and C video (green).
- 4-character, 7-segment LED display for system setup and control.
- IrDA pairing LEDs (Blue / Red)
- RF Wireless battery chargers with status LED indication of charging / full charge condition

Material and Finish
18 AWG CRS steel / .047" nom. with zinc undercoat and white powder coat paint or CAD plate.
Dimensions: HNB-A, B, C units internal to EO box:
Length: 3.23" / 82mm, Width: 3.37" / 85.5mm, Height: 2.54" / 64.4mm
Dimensions: HNB-A, B carton:
Length: 5.5" / 139.7mm, Width: 7.5" / 190.5mm, Height: 4.6" / 116.8mm
Dimensions: HNB-C, C1 carton:
Length: 11.25" / 285.75mm, Width: 12.0" / 304.8mm, Height: 4.6" / 116.8mm
Weight:
HNB-A, HNB-B: Product:1.75 lbs., Shipping: 2.25 lbs.
HNB-C (C1, C2, C3): Product: 2.0 lbs., Shipping: 2.5 lbs.

* Note: HNB can drive 25V-70V speakers with optional HNB-70V2X matching impedance transformer (see page 24, section 5.2)

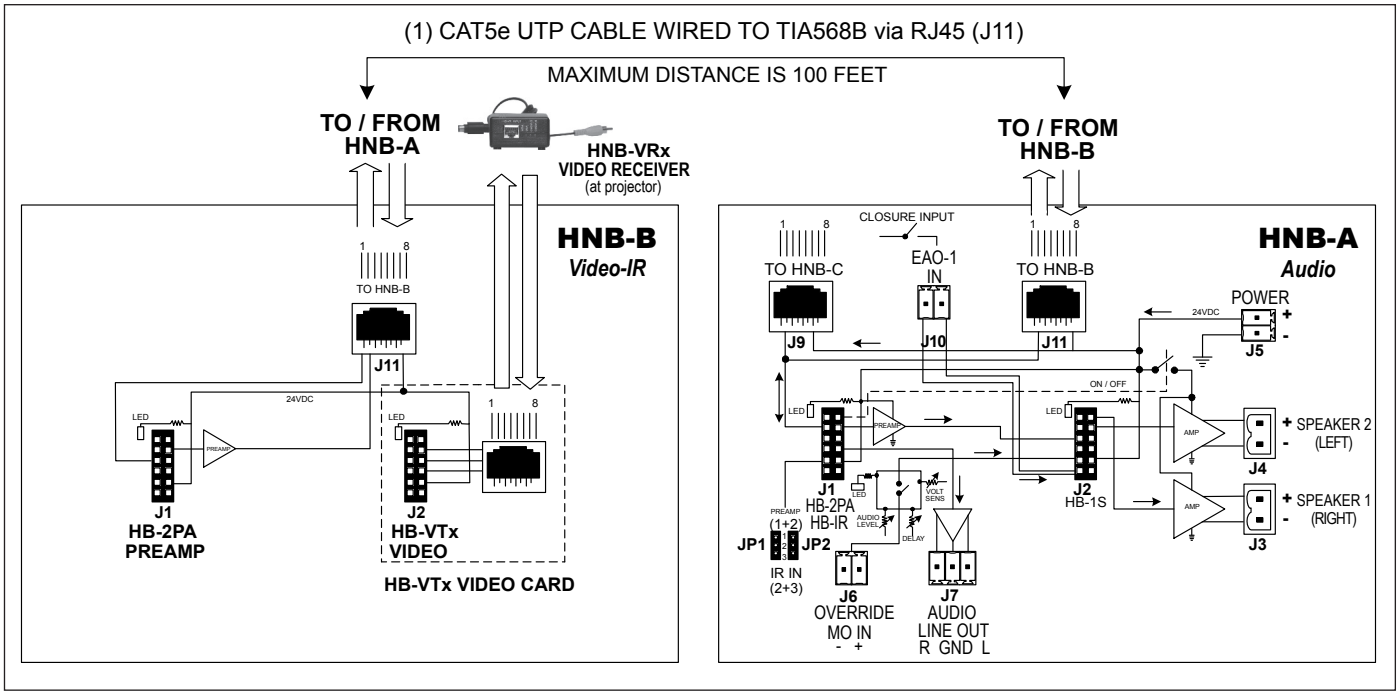
2.2 Dimensions HNB-A, HNB-B and HNB-C



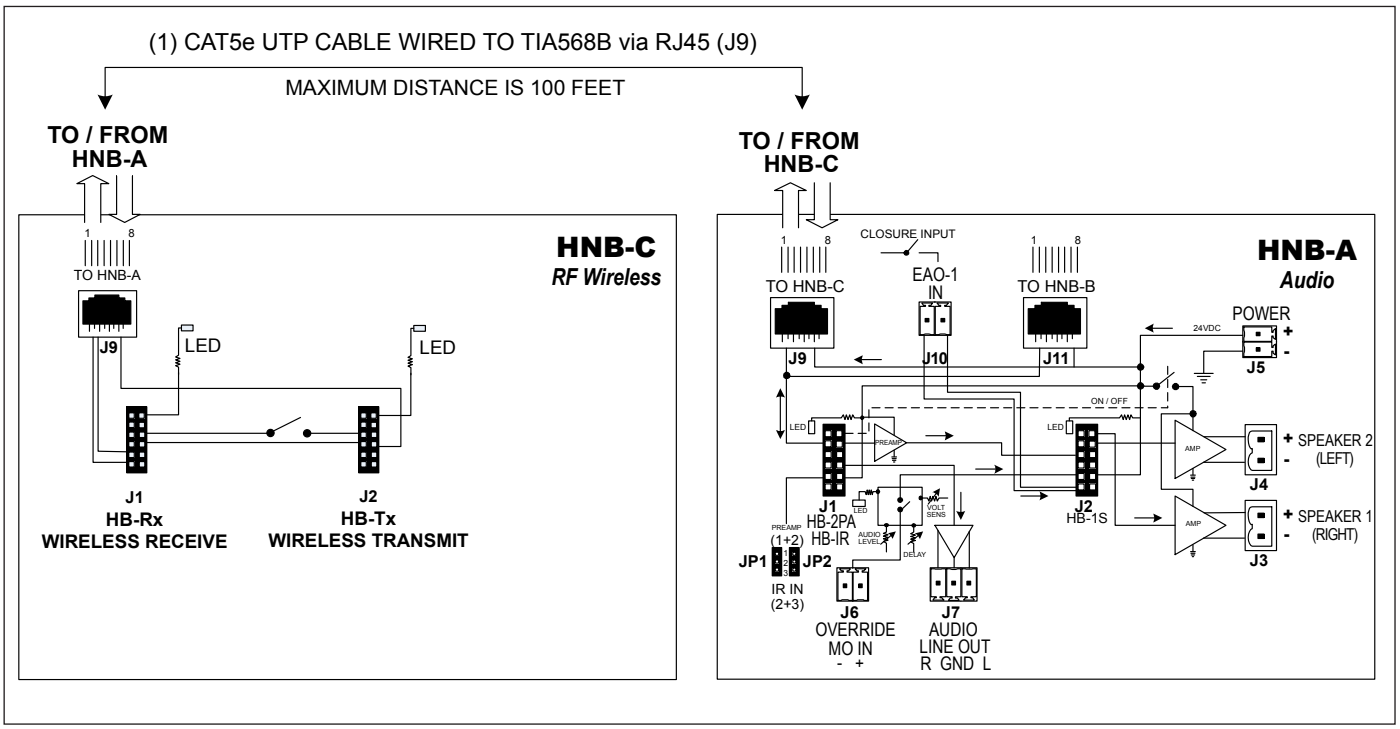
HNB-A
(shown without cover plate)

NOTE: HNB-B and HNB-C have the same dimensions.

2.3 HNB-A + HNB-B Signal Flow Block Diagram

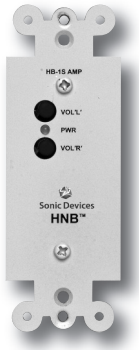


2.4 HNB-A + HNB-C Signal Flow Block Diagram

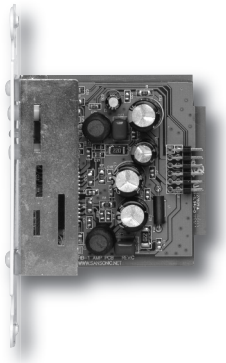


SECTION 3.0 - HNB-A + HNB-B + HNB-C SYSTEM COMPONENTS

3.1 Plug-in Module: Amplifier Module HB-1S



HB-1S
Front view



HB-1S
Side view

Use in HNB-A **RIGHT SLOT**

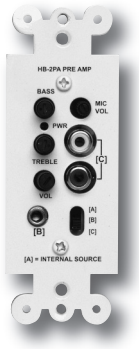
Amplifier Module (HB-1S)

The HNB amplifier module HB-1S is included with HNB-A. It always plugs into the **RIGHT SLOT** (**J2**) of HNB-A and provides high fidelity Stereo and Mono audio (digital class-D power) to any 4- or 8-ohm speakers. The HNB amplifier will support 70V speakers using SonicDevices HNB-70V2X matching impedance transformer unit that may be ordered separately (see page 24, section 5.2).

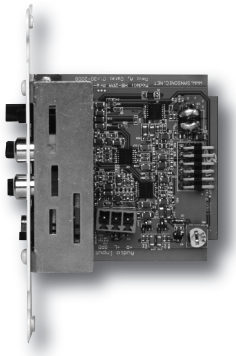
Module Features:

- Robust digital class-D architecture with better than 85% efficiency.
- Dual channel 25W into 4-ohm / 12W at 8-ohm operation.
- Mono or stereo operation with full bandwidth operation 20Hz - 20kHz.
- Fits into standard 2-gang electrical box (3.5”DEEP) with Decora wall plate.
- Automatic over current and over temperature protection.
- Manual front volume controls for R+L channels.
- IR control of each channel’s volume, bass, treble, balance (See HB-IR).
- Visible active power status LED’s for each channel (Green).
- Powered via HNB backplane at 24VDC from one UL/Energy Star listed wall power supply.

3.2 Plug-in Module: Pre-amp Module HB-2PA



HB-2PA
Front view



HB-2PA
Side view

Use in HNB-A or HNB-B **LEFT SLOT**

Preamplifier Module (HB-2PA)

The HNB preamplifier module HB-2PA is an integrated, high fidelity audio mixer that can be used in the **LEFT SLOT** of **EITHER** the **HNB-A** or the **HNB-B** chassis. It provides multiple balanced line inputs at nominal 1V/600 ohm line level (A+B+C) via phoenix, RCA and 3.5mm connections that can be selected via IR remote control or a manual front slide switch.

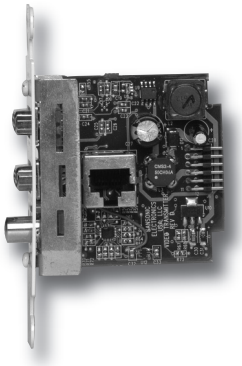
Audio inputs can be shaped for greater intelligibility via front accessible controls for treble, bass and volume. Inputs may be mono or stereo and are automatically routed to the HB-1S amplifier SPEAKER 1 (R) + SPEAKER 2 (L) and AUDIO LINE OUTPUT (J7) on the rear backplane. An internal audio input connection used for audio or microphone input has a ducking control (0dB to -50dB) which automatically ducks the ‘B’ + ‘C’ audio sources when voltage is present from the HNB-C RJ45 microphone input.

Module Features:

- Stereo or Mono operation at full bandwidth of 20Hz - 20kHz.
- Multiple audio source inputs via common phoenix, 3.5mm, RCA terminations.
- Audio source selection via front slide switch (A+B+C).
- Fits into standard 2-gang electrical box (3.5”DEEP) with Decora wall plate.
- AM/FM ‘RF’ and audible noise suppression.
- Signal to noise at 85dB and sensitivity at -16dBu.
- Manual front volume controls for audio and HNB-C microphone channels.
- IR control of each channel’s volume, bass, treble, balance (see HB-IR).
- Independent automatic duck control of all audio when HNB-C RF Wireless microphones are used (voltage sensitive).
- Visible active power status LED (Green).
- Powered via HNB backplane at 24VDC from one UL/Energy Star listed wall power supply.

3.3 Plug-in Module and Receiver: Video Transmit Module HB-VTx and HB-VRx Video Receiver

HB-VTx
Front view



HB-VTx
Side view

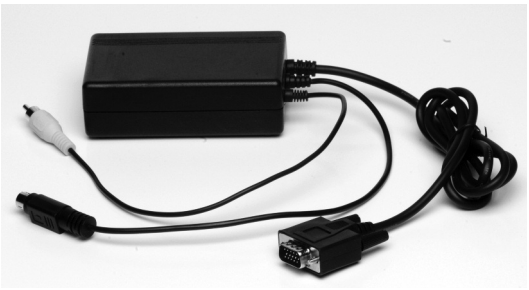
Use in HNB-B **RIGHT SLOT**

Video Transmit Module (HB-VTx)

The HNB video transmit module HB-VTx is an integrated high performance video input used to transmit VGA (RGB), Composite video and S-video signals to its companion HB-VRx receiver unit. HB-VTx provides a fully integrated and buffered 'loop through' monitor output to support desktop applications. Common connectors are utilized: DB-15HD, RCA and DIN. Video signal transmission is achieved via a single RJ45-CAT5e UTP cable to the HB-VRx receiver up to 150 feet / 45 meters between the HB-VTx and the HB-VRx units. Power and 'Signal Present' green LEDs are utilized at both 'Transmit' and 'Receive' ends.

Module Features:

- Supports multiple video source inputs: VGA, Composite video, S-video.
- Override priority to 'Video' inputs allows simultaneous use with VGA source.
- Fits into standard 2-gang electrical box (3.5" DEEP) with Decora wall plate.
- AM/FM 'RF' and audible noise suppression.
- Signal to noise at 85dB and sensitivity at -16dBu.
- Video transmission via CAT5e UTP up to 150' / 45M wired per EIA/TIA 568B.
- Operational bandwidth up to 350MHz.
- Video differential gain / phase at 2%.
- Attenuation loss at 1dB at 300' at 1MHz.
- Maximum capacitance at 20pf/foot UTP and 75-100 ohm impedance matching.
- Visible active 'Power' status and 'Video Signal' LEDs (Green).
- Powered via HNB backplane at 24VDC from one UL/Energy Star listed wall power supply provided with HNB-A.



HB-VRx
Front view

HB-VRx
Side view

Use at **AV Projector**

Video Receiver (HB-VRx)

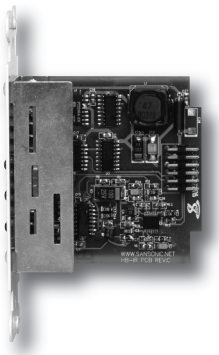
The HNB video receiver HB-VRx is an integrated high performance video receiver used to receive VGA (RGB), composite video and s-video signals from its companion HB-VTx transmit module. HB-VRx provides high performance impedance matching of video to the projector in VGA, composite and s-video formats. Common connectors are utilized: DB-15 HD, RCA, and DIN. Video signal transmission is achieved via a single RJ45-CAT5e UTP cable from the HB-VTx module up to 150 feet / 45 meters between the HB-VTx and HB-VRx units. Visible 'Power' and 'Signal Present' Green LEDs are utilized to support easy installation and trouble shooting.

Receiver Features:

- Supports multiple video source inputs: VGA, composite video, S-video.
- Provides convenient discrete VGA, S-video and composite cables for direct connection to AV projectors.
- Override priority to 'Video' inputs allows simultaneous use with VGA source.
- Compact plastic housing for easy mounting at the projector.
- AM/FM 'RF' and audible noise suppression.
- Signal to noise at 85dB and sensitivity at -16dBu.
- Transmission via single CAT5e UTP cable up to 150' / 45M wired per EIA/TIA 568B.
- Operational bandwidth up to 350MHz.
- Video differential gain / phase at 2%.
- Attenuation loss at 1dB at 300' at 1MHz.
- Maximum capacitance at 20pf/foot UTP and 75-100 ohm impedance matching.
- Visible active 'Power' status and 'Video Signal' LEDs (Green).
- Powered via HNB backplane at 24VDC from one UL/Energy Star listed wall power supply provided with HNB-A.

3.4 Plug-in Module with Remote: IR Module HB-IR and Hand-held Remote HB-IRRC

HB-IR
Front view



HB-IR
Side view

Use in HNB-A **LEFT SLOT**

HB-IRRC
Front view

IR Module (HB-IR)

The HNB IR module HB-IR is an integrated high performance infrared dual channel micro-controlled receiving module that is operational up to 50 feet / 15 meters to control and shape HNB audio. Note: When the HB-IR module is used it MUST insert into the **HNB-A LEFT SLOT** next to the HB-1S amplifier module.

Module Features:

- High visibility 4-character, 7-segment LED display.
- Fits into standard 2-gang electrical box (3.5”D) with Decora wall plate.
- Multi-function micro control operation for bass, treble, balance, volume, mute, on/off.
- Visible active ‘Power’ status LED (Green).
- Powered via HNB backplane at 24VDC from one UL/Energy Star listed wall power supply provided with HNB-A.

IR Remote (HB-IRRC)

Remote Features:

- Durable hand-held remote control using common AA batteries.
- Full operation up to 50 feet / 15 meters at 45 degree off axis.
- Controls for Power, Volume +/-, Select Input (1, 2, 3), Mute All.
- 3.5mm mini jack for Headphone.
- Manual soft push buttons for controlling On/Off, Volume (+/-).

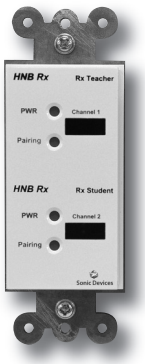
3.5 Power Supply: 24VDC included with HNB-A units

HB-PS
Power Supply

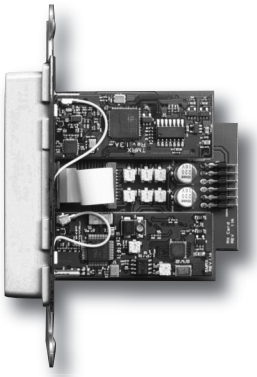
Power Supply (HB-PS) :

- 24VDC/2.5A regulated switching wall supply included with HNB-A units.
- Pre–connectorized cable (2–pin dockable)
- UL 1310, Class 2, low-voltage, Energy Star rated, FCC, CUL, CE.

3.6 **Plug-in Modules for RF Wireless**: Receive Module HB-RX and Transmit Module HB-TX



HB-Rx
Front view



HB-Rx
Side view

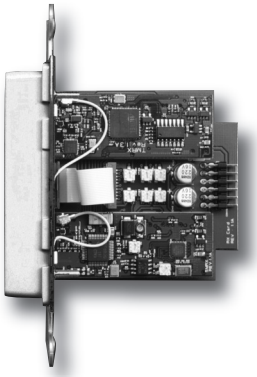
HB-Rx Wireless 2-channel RF RECEIVER Module

The HB–Rx RF Wireless Receiver module is included in all versions of HNB–C providing multiple (x2) independent RF wireless channels operating simultaneously. HB–Rx always plugs into the LEFT slot of the HNB-C chassis. It includes robust high power diversity antennas with secure channel separation and filtering algorithms insuring total room coverage for simultaneous operation without interference, noise, or drop outs. HB-Rx includes IrDA 'pairing' up to 1m/3' with visual LED indicators (Red/Blue) and activation in under ten (10) seconds. Compatible with all HNB™ teacher microphone headsets (Series TM) and hand-held student microphones (Series SM). No calibration or adjustments required to activate HNB-C linked microphones

Module Features:

- (2) RF Receive channels with distinct, secure ID link and code selection supporting an UNLIMITED number of classrooms without RF interference, collision or conflict.
- RF Signal coverage with 40 foot radius / 80 foot diameter in X-Y-Z three dimensional axis – eliminates DEAD SPOTS in 40' x 40' x 10' classroom (typical).
- HNB-C RF system design is impervious to LIGHT or room architecture “line-of-sight” issues.
- Simultaneous broadcast of (2) channels to HNB-A amplifier for exceptional speech intelligibility.
- Single CAT5e low cost, simple link and integration with HNB-A audio sources and amplifier.
- Fits 2-gang E.O. box (3.5” DEEP) with Decora wall plate (provided).
- Front panel visible status LED’s for Power and Pairing (Blue/Red) with On/Off push button activation.
- Secure IrDA (Infrared Data Association) pairing for (2) channels in under (10) seconds.
- Power 5V nominal via HNB-A common 24VDC/2.5A power supply.

HB-Tx
Front view



HB-Tx
Side view

HB-Tx Wireless 2-channel RF TRANSMIT Module

The HB-Tx RF Wireless Transmit module is included with the HNB–C unit providing multiple (x2) independent RF wireless channels operating simultaneously and in unison with the HB-RU receivers. It includes on-board high power antennas for total room coverage with an unlimited number of users per room (per system) without interference, noise, or drop outs. HB-Tx includes secure IrDA 'pairing' up to 1m/3' with visual LED indicators (Red/Blue) and activation in under ten (10) seconds. A simple front slide switch allows use for simultaneous 2nd language TRANSLATION. Additionally, HB-Tx supports an UNLIMITED number of HB-RU receivers per HNB-C.

Module Features:

- (2) RF Transmit Channels broadcasting the HB-Rx signals to ‘unlimited’ number of users with HB-RU receive units supporting ADA ‘assisted listening’ and ‘hard-of-hearing’ users.
- Supports live ad-hoc 2nd language translation activated by front panel slide switch.
- RF Signal coverage with 40 foot radius / 80 foot diameter in X-Y-Z three dimensional axis – eliminates DEAD SPOTS.
- HNB-C RF system design is impervious to LIGHT or room architecture “line-of-sight” issues.
- Secure IrDA (Infrared Data Association) pairing for (2) channels in under (10) seconds to unlimited number of HB-RU receivers.
- Front panel visible status LED’s for Power and Pairing (Blue/Red) with On/Off push button activation.
- Power 5V nominal via HNB-A common 24VDC/2.5A power supply.

3.7 Microphones with Accessories for RF Wireless

TM1
Over-the-ear style
with built-in Transmitter

TM2
Around-the-neck style with
2oz. transmitter
belt clip and lanyard

TM3
Hanging-pendant style with
2oz. Transmitter,
belt clip and lanyard

SM1
with charger stand

Teacher Microphones (TM1, TM2, TM3)

- High performance voice intelligible microphone 100Hz-15kHz.
- Ergonomic and lightweight with robust flexible boom microphone (TM1, TM2).
- Lithium Ion polymer rechargeable batteries with 5-6 hour talk, (90) minute fast 100% recharge, 50% charge in (30) minutes.
- 24 bit DDS (Direct Digital Synthesizer) with secure channel lock.
- IrDA secure link 'pairing' in under ten (10) seconds.
- Audio latency less than 4ms, S/N >60dB
- Link / Re-Link in one (1) second (nominal).
- Visual LED status for: Link, Re-link, Pairing, On/Off.
- 40' radius nominal use, 60' line-of-sight coverage.
- Lightweight (2 oz.) Transmitter for comfort and ease-of-use (TM2, TM3).
- Accessory beltclip with 360º rotation and locking lanyard (TM2, TM3).
- Battery charger with wall mount 6v UL / Energy Star rated power supply.

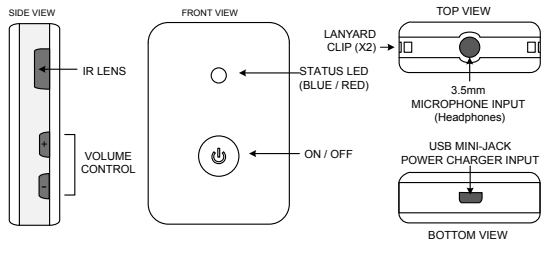
.

Student Hand-held Microphone (SM1)

- High performance dynamic microphone for solid speech reinforcement 100Hz – 15kHz.
- RF transceiver is data bidirectional with secure channel lock.
- Audio latency less than 4ms, S/N >60dB.
- IrDA secure link 'pairing' in under ten (10) seconds.
- (3) NIMH AAA rechargeable batteries with (90) minute fast 100% recharge.
- Low power design supports 6-8 hours talk time operation.
- Link / Re-Link in one (1) second (nominal).
- Visual LED status for: Link, Re-link, Pairing, On/Off.
- 40' radius nominal use, 60' line of sight coverage.
- Battery charger stand with wall mount 6v UL / Energy Star rated power supply.

3.8 Receiver with Headphones and Accessories for RF Wireless

HB-RU
Receiver with headphones, beltclip and locking lanyard



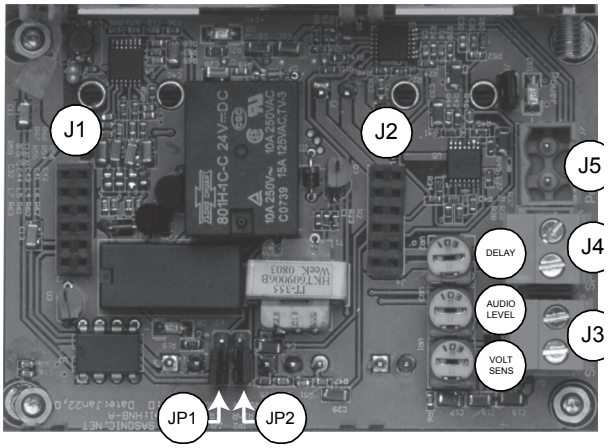
HB-RU Detail

Note: Teacher Microphone Models TM2 and TM3 include a 2 oz. transmitter that is visually similar to HB-RU Receiver without side volume control buttons and a darker (black) side band.

Assisted Listening Receiver (HB-RU) with Headphones and Accessories: Translation / ADA – Assisted Listening

- High performance RF receiver and headphones for solid speech reinforcement 100Hz – 10kHz in Mono or Stereo.
- 3.5mm universal audio input jack compatible with standard headphones (by others).
- Lightweight and compact (2 oz.) insures comfort and ease of use.
- Volume control buttons (+/-).
- Channel 1 - 2 selection buttons for use with Translation.
- IrDA secure link 'pairing' in under ten (10) seconds within 1m / 3' of HB-TX module.
- UNLIMITED number of users per HNB-C / TX in each classroom.
- Link / Re-Link in one (1) second (nominal).
- Visual LED status for: Link, Re-link, Pairing, On/Off.
- 40' radius nominal use, 60' line of sight coverage.
- Lithium Ion Polymer rechargeable batteries with 5-6 hour continuous talk time, (90) minute FAST 100% recharge and 50% charge in (30) minutes.
- Low power design supports 6-8 hours continuous listen time.
- Accessory beltclip with 360º rotation and locking lanyard.
- Battery charger with wall mount 6v UL / Energy Star rated power supply.

3.9 HNB- A Chassis FRONT and REAR



HNB-A Chassis Front

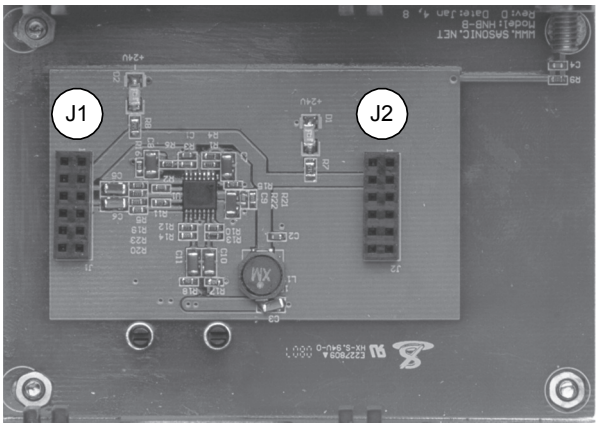
J1 .....HB 'LEFT module slot (HB-2PA preamp or HB-IR)
J2 .....HB 'RIGHT' module slot (HB-1S amp)
J3 .....Speaker 1 (Right) output
J4 .....Speaker 2 (Left) output
J5 .....Power input (24VDC/2.5A)
JP1 .....Jumper/Header option (Preamp 1+2 or IR 2+3)
JP2 .....Jumper/Header option (Preamp 1+2 or IR 2+3)
Delay.....Delay time for 'MO' override
Audio Level ..Audio level control for 'MO' override
Volt Sens .....Voltage sensitivity 1V-70V for 'MO' override

Note: J1 and J2 have power status LED's that illuminate (Green) when power is provided from the HNB-A (HB-PS power supply).

HNB-A Chassis Rear

J6 .....'MO' Master Override input +/- 1V to 70V
J7 .....Audio line out / L+R, Ground: 1V-600ohm nominal
J9 .....Main control I/O to HNB-B unit / CAT5e UTP up to 100'/40M
J10 .....EAO-1 Emergency Audio OFF override input from
.....Emergency systems / contact closure (no polarity)
J11 .....Interface I/O to HNB-C unit / CAT5e UTP up to 100'/33M

3.10 HNB-B Chassis FRONT and REAR



HNB-B Chassis Front

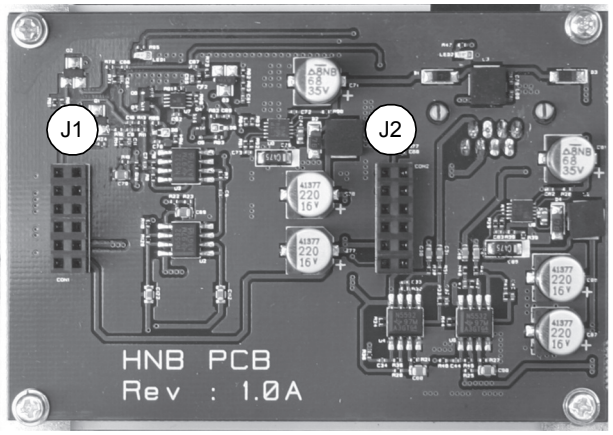
J1 .....HB 'LEFT module slot (HB-2PA preamp)
J2 .....HB 'RIGHT' module slot (HB-VTx video)

Note: J1 and J2 have power status LED's that illuminate (Green) when power is provided from the HNB-A (HB-PS power supply).

HNB-B Chassis Rear

J3 .....Interface I/O to HNB-A unit / CAT5e UTP up to 100'/33M

3.11 HNB-C Chassis FRONT and REAR



HNB-C Chassis Front

J1 .....HB 'LEFT module slot (HB-Rx module)
J2 .....HB 'RIGHT' module slot (HB-Tx module)

Note: J1 and J2 have power status LED's that illuminate (Green) when power is provided from the HNB-A (HB-PS power supply).

HNB-C Chassis Rear

J9 .....Interface I/O to HNB-A unit / CAT5e UTP up to 100'/33M

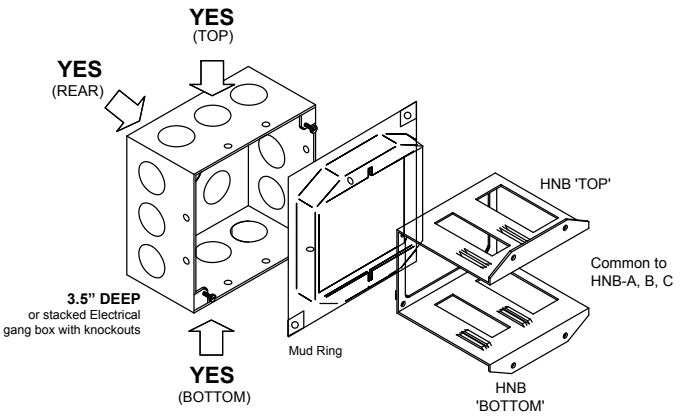
SECTION 4.0 - HNB-A + HNB-B + HNB-C INSTALLATION

4.1 In-wall / In-ceiling installation: 3.5” Deep Electrical Box (2, 4, or 6 gang)

HNB-A, HNB-B, HNB-C INSTALL WITH CONDUIT OR CLAMP CONNECTORS TO ELECTRICAL GANG BOX

Install Note: HNB-C should be installed 48" from the floor (or lower) to insure ease of ‘pairing’ wireless headsets, micro-phones and receivers.

Install Note: HNB-A, B, C are easily interconnected by ONE CAT5e cable up to 100 FEET between units!

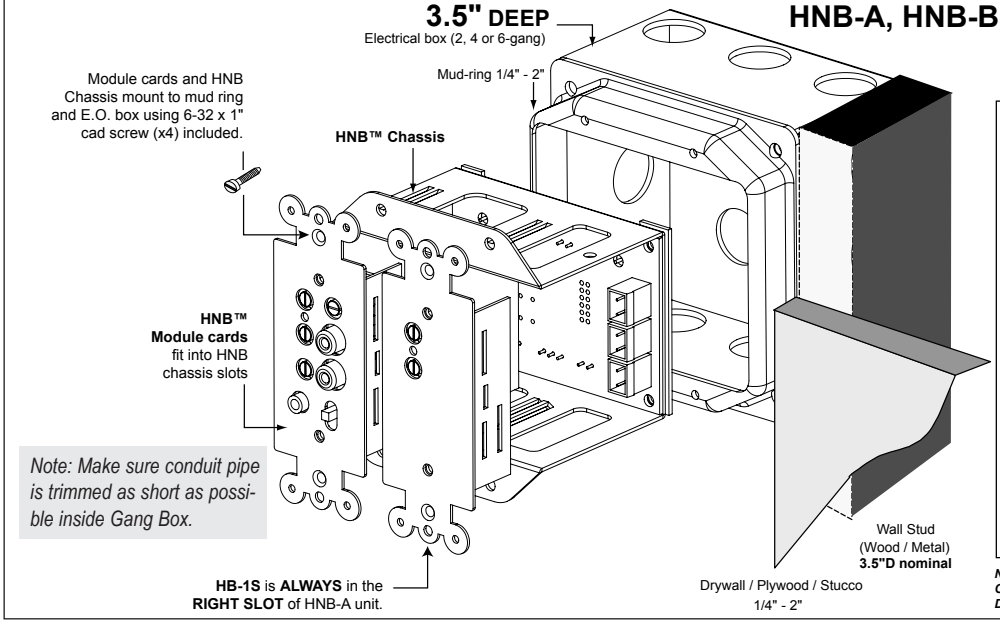


IMPORTANT NOTE:
When using conduit and/or strain relief 'Clamp' connectors for wiring to / from the HNB™, **DO NOT CONNECT TO THE SIDE KNOCKOUTS** of the electrical box.

Use **TOP**, **BOTTOM** or **REAR** knockouts in a DEEP box.

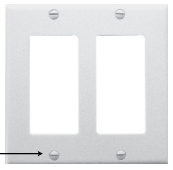
NOTE: Insure UL/NEMA rated hardware and wiring are used to meet all NEC / NFPA and local electrical and building codes.

HNB-A, HNB-B, HNB-C



Note: Make sure conduit pipe is trimmed as short as possible inside Gang Box.

HNB-A, HNB-B and HNB-C 2-gang devices can be mounted in separate or common gang-size electrical boxes (2, 4 or 6-gang).



2-gang Decora wall plate with 6-32 x 1/4" screws (x4) with **white** head included. Screws mount wall plate to HNB.

NOTE: ELECTRICAL BOX, MUD-RING, CONDUIT CONNECTORS, 4 AND 6-GANG DECORA WALL PLATES ARE NOT PROVIDED.

4.2 Accessories (by others) - Determine which accessories will be required.

Electrical Outlet Box:	4" Square x 3.5" DEEP is required for HNB-A, B, or C units. See RACO (www.hubbell-raco.com) models: #255, #256, #696, #698 or equivalent UL/NEMA rated utility box appropriate to the installation. You may “stack” electrical boxes or utilize appropriate Mud-ring to achieve 3.5" DEEP within the electrical box (refer to Raco #781 or #795 at 1.25" – 1.5").
Mud Ring:	4" square / 2-gang opening from 1/4" to 2.0" as needed to match wall or ceiling construction (see Electrical Outlet box above).
Conduit:	EMT, rigid or flex conduit may be required, for ceiling or wall installations, to meet local building codes or authority having jurisdiction (AHJ) requirements. NOTE: CONDUIT MUST ENTER THE E.O. BOX PER DIAGRAM (above) FOR PROPER FIT.
HNB Wiring:	HNB Speaker Wiring: 16-18 AWG twisted pair stranded cable. HNB-A, B, C interconnection: CAT5e cable meeting UL1661/1685, ISO/IEC 11801, TIA/EIA 568B, IEEE 1202, NEC 725-800, CSA FT-4 for in-wall or ceiling use to meet local building code requirements.
Ceiling Support:	In-ceiling installation MUST have adequate HNB™ support above the suspended ceiling grid system and needs to follow local building codes and utilize a hanger assembly such as Erico/CADDY UL listed models 512HD or 512HDXT or equivalent.
Outlet Box Cover:	Secure clear wall cover for HNB – please contact STI (www.sti-usa.com / 800-888-4784) regarding models STI-7510E or STI-7510D or equivalent.

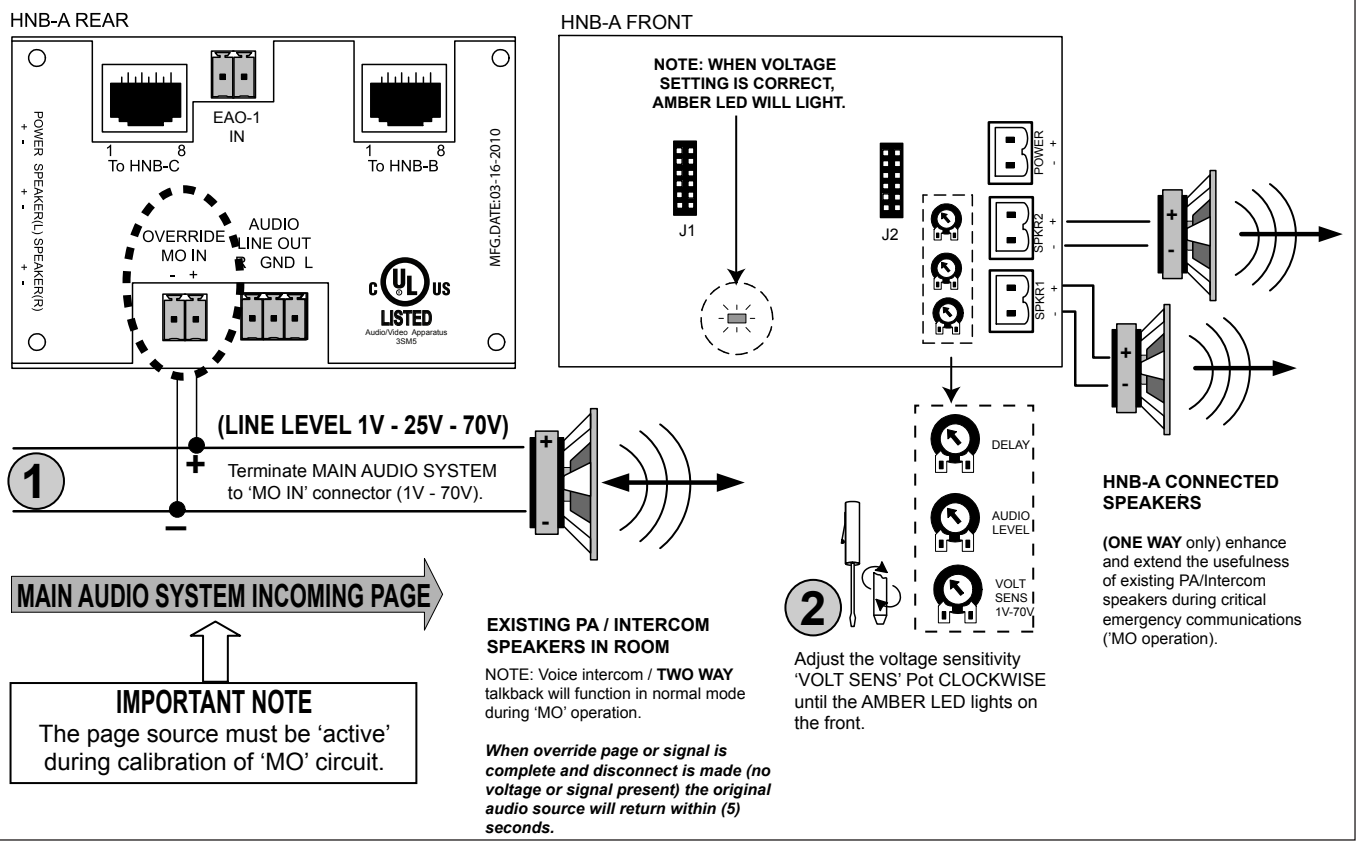
4.3 Optional Impedance Matching Transformer - for use with 25V-70V speakers

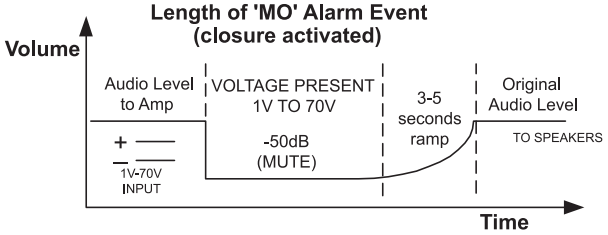
HNB-70V2X has high performance 30W matching impedance transformers capable of driving 25V or 70V speakers. Ready-to-install assembly is housed in a metal UL-CUL approved electrical junction box with ¾" – 1" electrical knock-outs on all (4) sides with grounding screw, top cover plate with corrosion resistant powder coat grey paint and comes with electrical wire nuts for 16-18 AWG stranded cable connections. The HNB-70V2X two-channel transformer is ordered separately. See detailed information in Section 5.2

4.4 HNB-A Master Override Input Connection, Adjustment and Operation

1. Terminate MAIN AUDIO SYSTEM to 'MO IN' 2-pin connector (1V - 70V) on rear panel. When 'MO IN' is terminated all audio sources to INPUTS 1-4 will instantly shut down (-50dB).

2. Adjust the voltage sensitivity 'VOLT SENS' Pot CLOCKWISE until the AMBER LED lights on the front panel. Proceed to adjust AUDIO LEVEL and DELAY Pots as needed to match PA and intercom performance needs. IMPORTANT NOTE: The PAGE SOURCE must be ACTIVE during set up.


HNB-A REAR
POWER SPEAKER(L) SPEAKER(R)
EAO-1 IN
1 8 To HNB-C
1 8 To HNB-B
OVERRIDE MO IN
AUDIO LINE OUT R GND L
MFG.DATE:03-16-2010
HNB-A FRONT
NOTE: WHEN VOLTAGE SETTING IS CORRECT, AMBER LED WILL LIGHT.
J1
J2
POWER
SPKR2
SPKR1
DELAY
AUDIO LEVEL
VOLT SENS 1V-70V
(LINE LEVEL 1V - 25V - 70V)
Terminate MAIN AUDIO SYSTEM to 'MO IN' connector (1V - 70V).
MAIN AUDIO SYSTEM INCOMING PAGE
IMPORTANT NOTE
The page source must be 'active' during calibration of 'MO' circuit.
EXISTING PA / INTERCOM SPEAKERS IN ROOM
NOTE: Voice intercom / TWO WAY talkback will function in normal mode during 'MO' operation.
When override page or signal is complete and disconnect is made (no voltage or signal present) the original audio source will return within (5) seconds.
Adjust the voltage sensitivity 'VOLT SENS' Pot CLOCKWISE until the AMBER LED lights on the front.
HNB-A CONNECTED SPEAKERS
(ONE WAY only) enhance and extend the usefulness of existing PA/Intercom speakers during critical emergency communications ('MO operation).

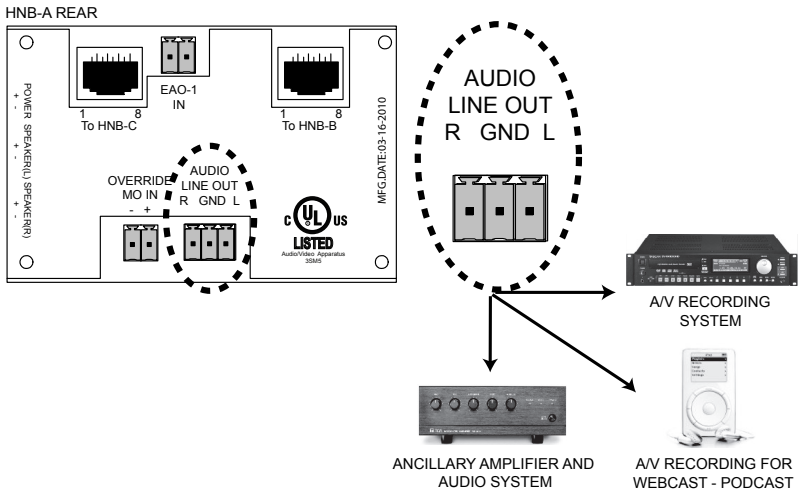


'MO' Master Override initiates an automatic 'MUTE' at 10ms attack and release at 3-5 seconds of **ALL** HNB audio sources.

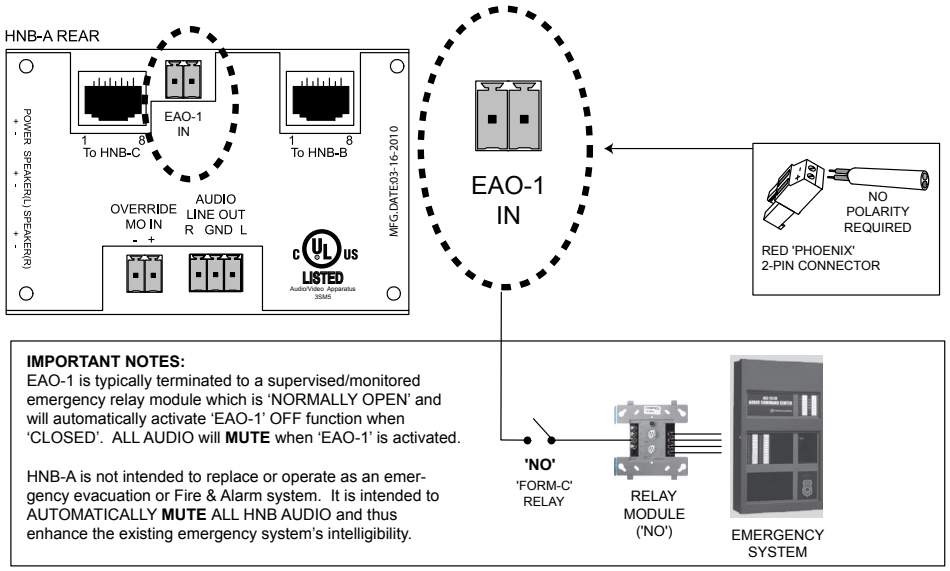
Note: When 'MO' is activated and 'Voltage Present' is detected on the 'MO' 'J6' input (see section 3.9), all audio sources to HB-2PA preamp are immediately 'MUTED' to the amp and speakers.

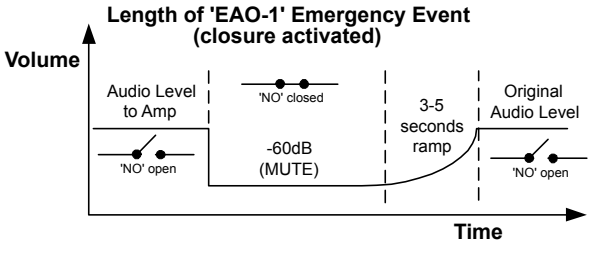
Only the 'MO' audio signal routes to the amp and is broadcast to speakers during 'MO' activation. The 'MO' input audio level **IS ADJUSTABLE** and can be different than the original source material.

4.5 HNB-A Audio Line Output: (1V, 600ohm, -10db nominal, Mono or Stereo)



4.6 HNB-A Emergency Audio OFF 'EAO-1'


HNB-A REAR
POWER SPEAKER(L) SPEAKER(R)
EAO-1 IN
1 8 To HNB-C
1 8 To HNB-B
MFG.DATE:03-16-2010
OVERRIDE MO IN
AUDIO LINE OUT R GND L
c UL us LISTED
EAO-1 IN
NO POLARITY REQUIRED
RED 'PHOENIX' 2-PIN CONNECTOR
IMPORTANT NOTES:
EAO-1 is typically terminated to a supervised/monitored emergency relay module which is 'NORMALLY OPEN' and will automatically activate 'EAO-1' OFF function when 'CLOSED'. ALL AUDIO will MUTE when 'EAO-1' is activated.
HNB-A is not intended to replace or operate as an emergency evacuation or Fire & Alarm system. It is intended to AUTOMATICALLY MUTE ALL HNB AUDIO and thus enhance the existing emergency system's intelligibility.
'NO' 'FORM-C' RELAY
RELAY MODULE ('NO')
EMERGENCY SYSTEM



NOTE: WHEN 'EAO-1' IS ACTIVATED ALL AUDIO IS 'MUTED' TO SPEAKERS FOR DURATION OF CLOSURE ACTIVATION

Emergency Audio Off 'EAO-1' Automatic '**MUTE**' at 10ms attack and release at 3-5 seconds of **ALL** HNB Audio sources.

The 'EAO-1' circuit connects to a 'Normally Open' relay from a **supervised emergency system** and will automatically **MUTE** ALL AUDIO. When this relay opens and power is removed, the original audio source will return.

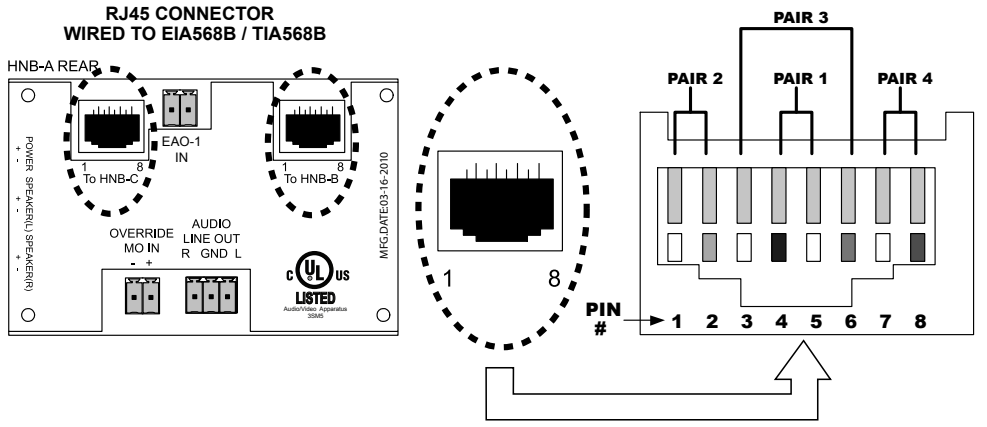
Note: 'EAO-1' is a '2-wire' connection which is NOT polarity sensitive.

Note: 'EAO-1' termination is to **RED 'Phoenix' 2-pin** connector.

4.6 HNB-A Emergency Audio OFF 'EAO-1' (continued)

IMPORTANT NOTE: There must be a primary Fire-Alarm system that works independently from HNB-A,B,C A/V system. The 'Emergency Audio Off' (EAO-1) input provided in HNB-A can only serve as a supplemental benefit to other primary emergency communication systems by 'MUTING' all HNB audio sources during an emergency event (EAO-1 closure is activated). UL does not recognize or list HNB as a primary Fire or Alarm system. EAO-1 emergency input is not supervised or monitored. As such, HNB-A can only be utilized as an enhancement to other primary emergency communication systems such as: Fire and Alarm, Security, EPA, EVAC, Intercom/Paging, Mass Notification. In all cases HNB installation must adhere to NEC and local building codes as determined by the Authority having Jurisdiction ('AHJ').

4.7 HNB-A RJ45 Connector Color Codes

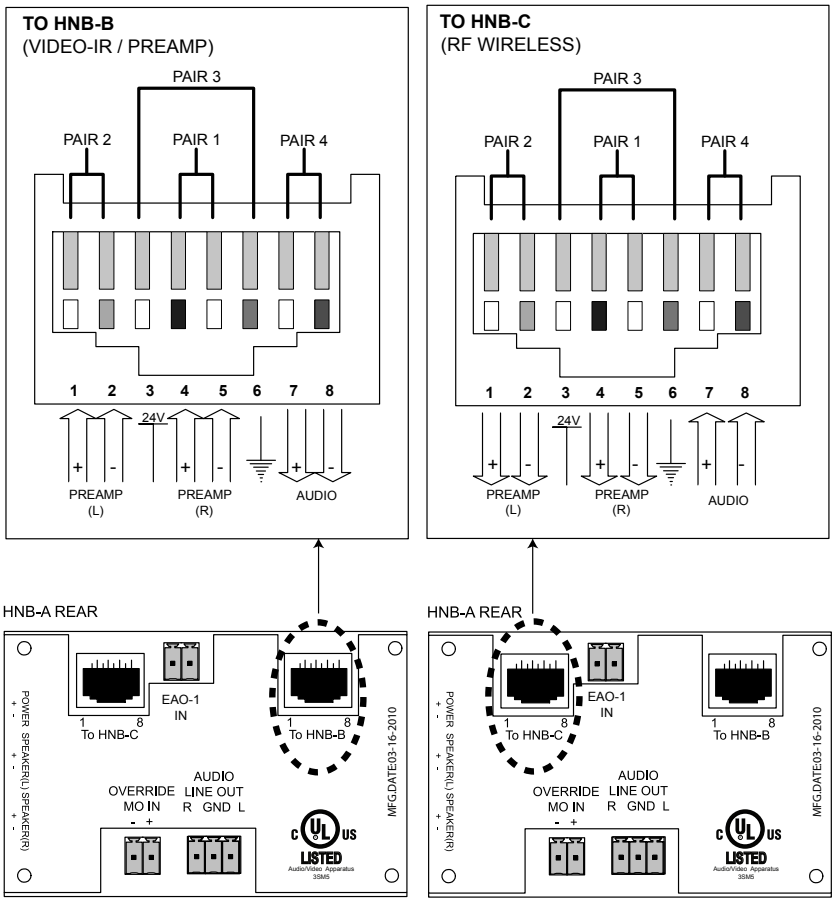


COLOR CODE I - 8 / CAT5e UTP cable

PAIR 1 = BLUE (4) + BLUE STRIPE (5)
PAIR 2 = ORANGE (1) + ORANGE STRIPE (2)
PAIR 3 = GREEN (6) + GREEN STRIPE (3)
PAIR 4 = BROWN (8) + BROWN STRIPE (7)

4.8 **Terminations:** HNB-A to HNB-B and HNB-C (C1, C2, C3)

Note: Wiring between HNB-A, HNB-B, and HNB-C units is accomplished via CAT5e UTP cabling which is operational up to 100 feet between units. Wiring must meet industry standards per the ANSI/EIA/TIA 568B specification latest issue. Additional information can be located at the following websites: www.ansi.org, www.eia.org and www.tiaonline.org.

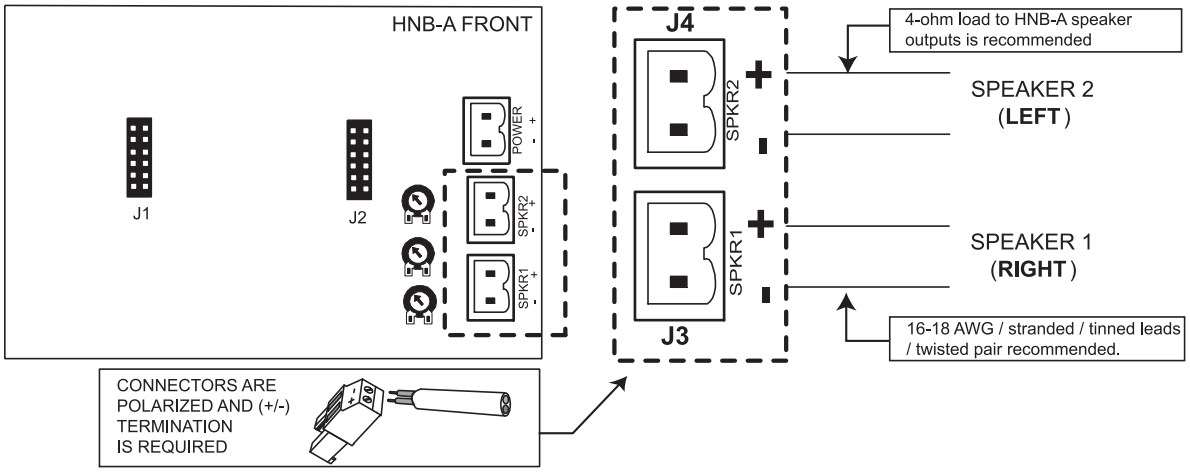


Terminations from HNB-A to HNB-B and HNB-C (C1, C2, C3)
are via RJ45 (J11) CAT5e UTP cable. Maximum length between units is 100 feet.

SECTION 5.0 - HNB-A SPEAKER WIRING

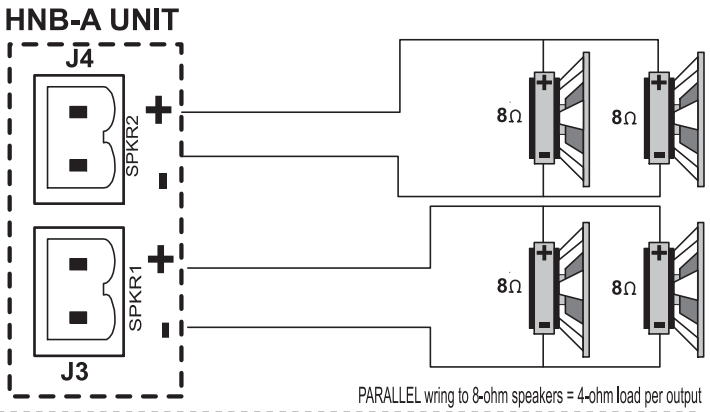
5.1 HNB-A output connections for speaker wiring

- HNB-A supports **MONO** or **STEREO** operation.
- HNB-A provides amplifier power to speakers via **J3** (speaker 1 / RIGHT) and **J4** (speaker 2 LEFT).
- Load to HNB-A '**J3**' and 'J4' should not go below 4-ohms.



HNB-A is a Class-2 low voltage device

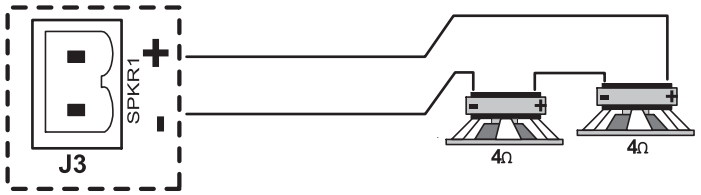
PARALLEL wiring to 8-ohm speakers (x2) creating a 4-ohm load to the amplifier per channel.



PARALLEL wiring to 8-ohm speakers = 4-ohm load per output

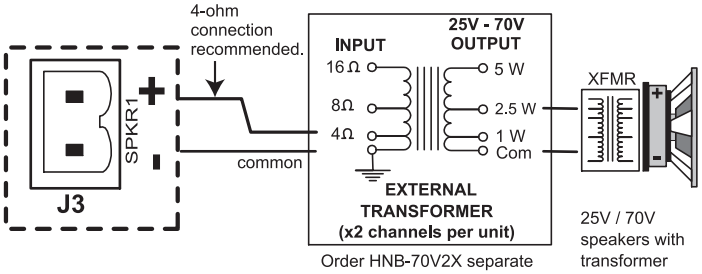
or

SERIES wiring to 4-ohm speakers = 8-ohm load per channel.



or

Wiring to 25V - 70V speakers with external matching impedance transformer Model HNB-70V2X. See section 5.2

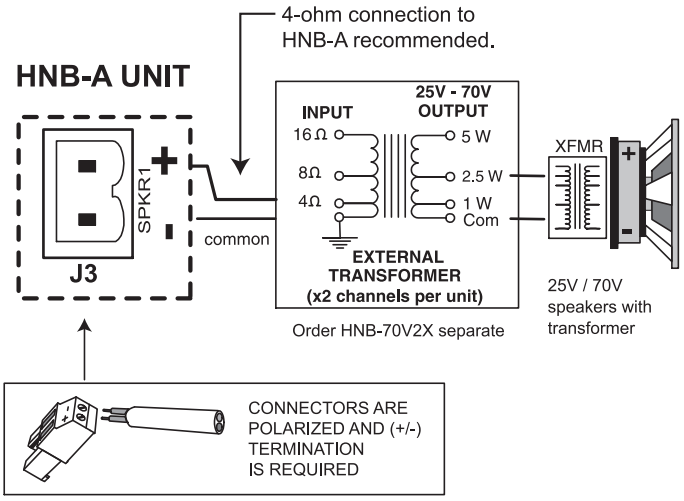


5.2 HNB-70V2X Impedance Matching Transformer (optional) for use with 25V-70V speakers

Shown open

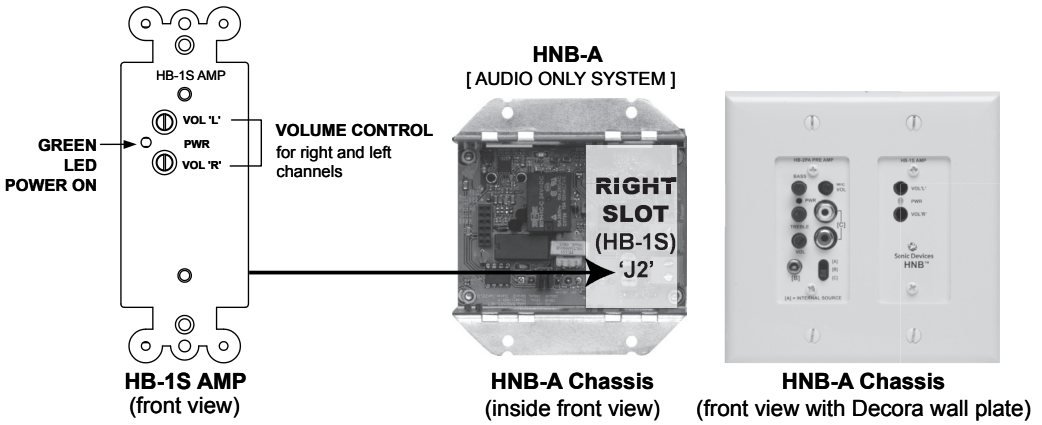
Shown with top cover plate

HNB-70V2X has high performance 30W matching impedance transformers capable of driving 25V or 70V speakers. Ready-to-install assembly is housed in a metal UL-CUL approved electrical junction box with ¾" – 1" electrical knockouts on all (4) sides with grounding screw, top cover plate with corrosion resistant powder coat grey paint and comes with electrical wire nuts for 16-18 AWG stranded cable connections.The HNB-70V2X two-channel transformer is ordered separately.



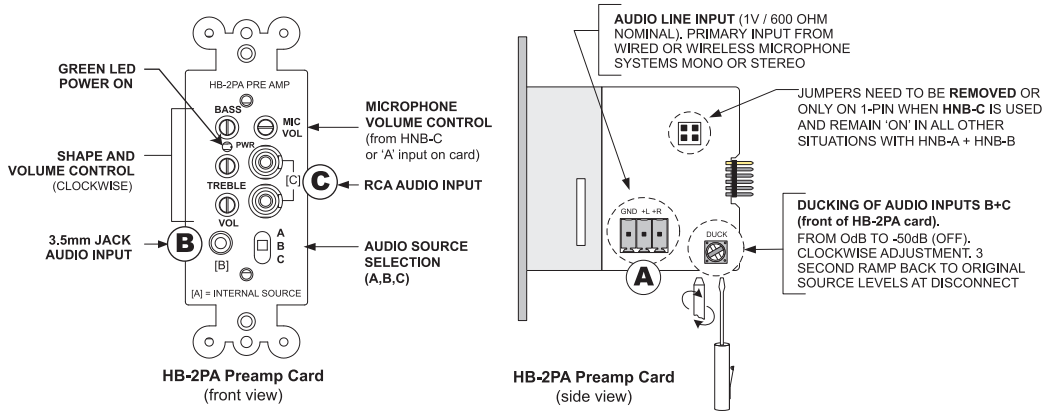
SECTION 6.0 - HNB-A + HNB-B + HNB-C MODULE CONNECTIONS AND ADJUSTMENTS

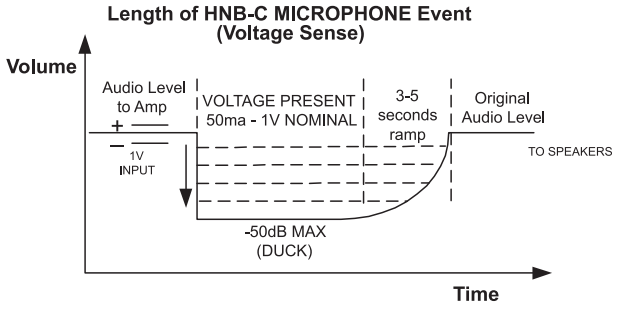
6.1 HB-1S Amp card: Adjustment and Location



Note: **HB-1S** Amp card **ALWAYS** fits into the **RIGHT SLOT** of HNB-A unit.

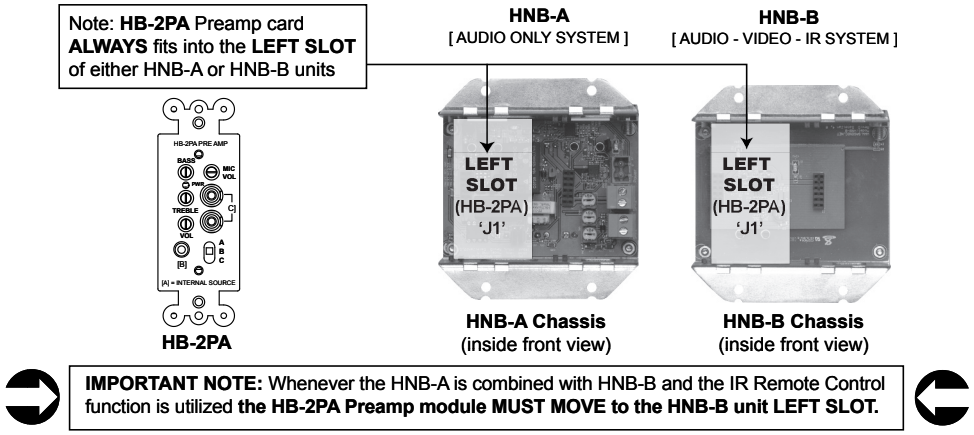
6.2 HB-2PA Preamp card: Input Adjustment, DUCK override adjustment, Location

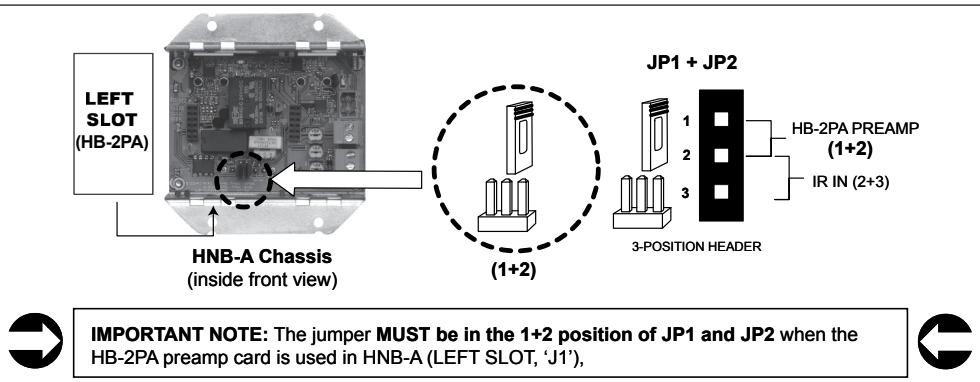

GREEN LED POWER ON
HB-2PA PRE AMP
BASS
MIC VOL
PWR
TREBLE
VOL
[C]
[B]
A B C
[A] = INTERNAL SOURCE
SHAPE AND VOLUME CONTROL (CLOCKWISE)
MICROPHONE VOLUME CONTROL (from HNB-C or 'A' input on card)
RCA AUDIO INPUT
3.5mm JACK AUDIO INPUT
AUDIO SOURCE SELECTION (A,B,C)
HB-2PA Preamp Card (front view)
AUDIO LINE INPUT (1V / 600 OHM NOMINAL). PRIMARY INPUT FROM WIRED OR WIRELESS MICROPHONE SYSTEMS MONO OR STEREO
JUMPERS NEED TO BE REMOVED OR ONLY ON 1-PIN WHEN HNB-C IS USED AND REMAIN 'ON' IN ALL OTHER SITUATIONS WITH HNB-A + HNB-B
GND +L +R
DUCK
DUCKING OF AUDIO INPUTS B+C (front of HB-2PA card).
FROM OdB TO -50dB (OFF). CLOCKWISE ADJUSTMENT. 3 SECOND RAMP BACK TO ORIGINAL SOURCE LEVELS AT DISCONNECT
HB-2PA Preamp Card (side view)



HB-2PA 'DUCK' Override initiates an automatic 'DUCK' of the HNB-B audio sources (B+C on Front) and is adjustable from 0dB to -50dB (Off) at 10ms attack time when signal is detected and releases at 3-5 seconds when signal is removed. This is an internal screwdriver manual 'POT' adjustment on the HB-2PA and is not normally end-user accessible.

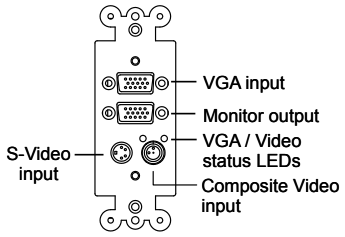
Note: When the internal audio line input is activated and 'Voltage Present' is detected, all audio sources (B + C) to HB-2PA are immediately 'DUCKED' to the amp and speakers. The audio line signal routes to the amp and is broadcast to speakers 'ON TOP' of the original audio source. The input audio level IS ADJUSTABLE and can be set different than the original source material.


Note: HB-2PA Preamp card ALWAYS fits into the LEFT SLOT of either HNB-A or HNB-B units
HNB-A [AUDIO ONLY SYSTEM]
HNB-B [AUDIO - VIDEO - IR SYSTEM]
HB-2PA
LEFT SLOT (HB-2PA) 'J1'
HNB-A Chassis (inside front view)
LEFT SLOT (HB-2PA) 'J1'
HNB-B Chassis (inside front view)
IMPORTANT NOTE: Whenever the HNB-A is combined with HNB-B and the IR Remote Control function is utilized the HB-2PA Preamp module MUST MOVE to the HNB-B unit LEFT SLOT.


LEFT SLOT (HB-2PA)
HNB-A Chassis (inside front view)
(1+2)
JP1 + JP2
1
2
3
HB-2PA PREAMP (1+2)
IR IN (2+3)
3-POSITION HEADER
IMPORTANT NOTE: The jumper MUST be in the 1+2 position of JP1 and JP2 when the HB-2PA preamp card is used in HNB-A (LEFT SLOT, 'J1'),

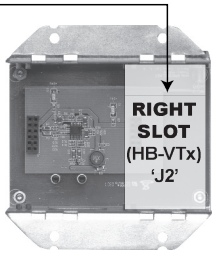
6.3 HB-VTx video card: Location

HB-VTx Video Transmit card installs into the **RIGHT SLOT** of HNB-B



HB-VTx

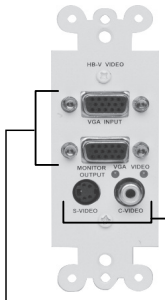
HNB-B
[AUDIO - VIDEO - IR SYSTEM]



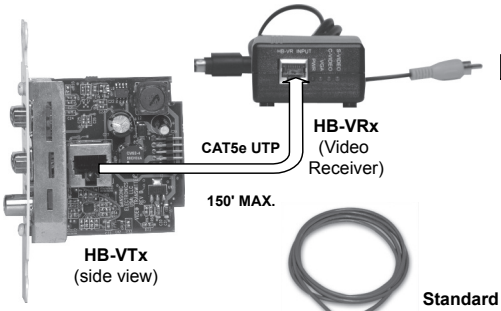
HNB-B Chassis
(inside front view)

IMPORTANT NOTE: The HB-VTx card always installs in the **RIGHT SLOT** of HNB-B.

6.4 HB-VTx video card + HB-VRx receiver: Connections



HB-VTx
(front view)



HB-VTx
(side view)

AV PROJECTOR
- **VGA/RGB** connection
- **S-VIDEO** connection
- **COMPOSITE VIDEO** connection

Standard CAT5e UTP cable is acceptable between HB-VTx video card and HB-VRx receiver up to **150 feet maximum** (45M). Power is routed from HB-VTx card to receiver. Wiring is standard ANSI/TIA/EIA 568B. Low-No skew or Shielded CAT5 cabling can be used and may improve video transmission performance.

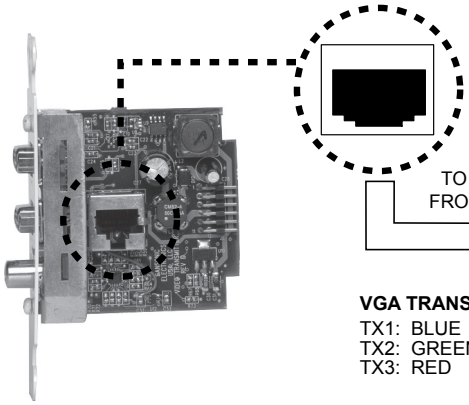
COMPUTER SOURCES

PC workstation with monitor or laptop PC VGA/RGB connection to **VGA INPUT.** 'Buffered' MONITOR OUTPUT is available for desktop application.

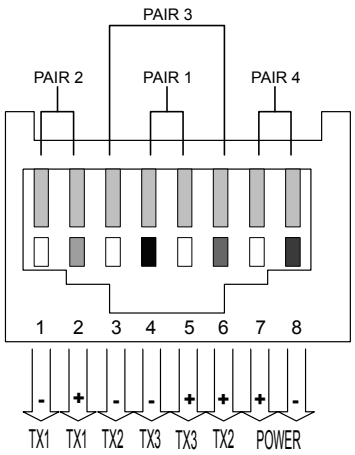
S-VIDEO AND COMPOSITE VIDEO SOURCES

Important Note: When both VGA/RGB (computer) and video sources (S-video or composite video) are connected and in 'Play' mode; the 'video' source will have priority to the projector. When the 'S' or 'C' video source is removed (off or stop) the VGA/RGB source will transmit to the projector.

RJ45 termination:
HB-VTx transmit to HB-VRx receive



TO HB-VRx RECEIVER
FROM HB-VTx VIDEO CARD

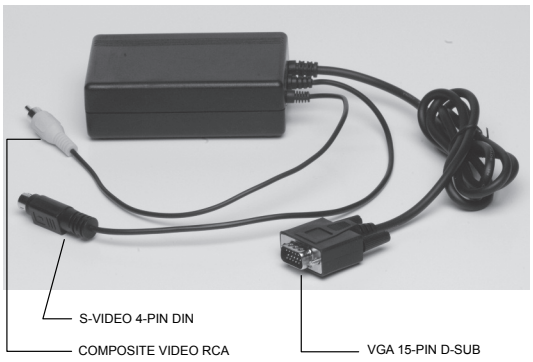


VGA TRANSMIT
TX1: BLUE
TX2: GREEN
TX3: RED

***VIDEO TRANSMIT**
TX1: COMPOSITE
TX2: S-VIDEO (Y)
TX3: S-VIDEO (C)
*VIDEO: S + COMPOSITE

6.5 HB-VTx video card + HB-VRx receiver: Operation

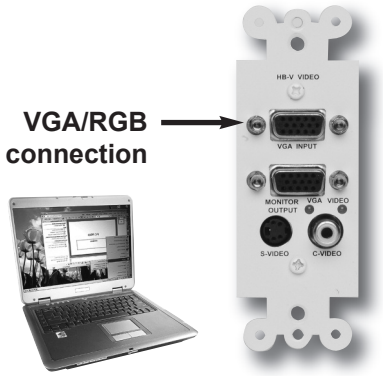
NOTE: It may take up to (10) seconds for the systems to sync up (handshake) and for the video signals to be transmitted and visible at the projector or display.



Wiring per ANSI/TIA/EIA 568B specifications.

After the RJ45/CAT5e cable is terminated and video signal and power are detected, the LEDs will immediately light provided cabling is correct. LEDs will light on both the HB-VTx video transmission card and the HB-VRx receiver simultaneously.

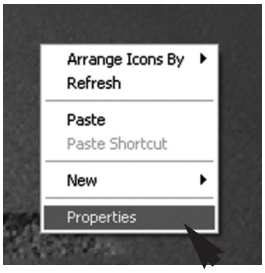
6.6 HB-VTx video card + HB-VRx receiver: Computer set-up



The HB-VTx video card and HB-VRx receiver are designed to work with a PC workstation/monitor or a laptop PC. The computer connects to the HB-VTx video card using a high performance VGA/RGB cable/connector to the 'VGA' INPUT'. If a desktop workstation is used; connect the VGA MONITOR output via a high quality cable to the monitor.

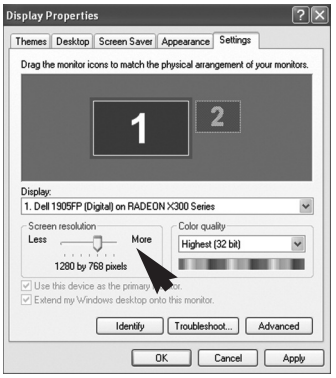
Performance of the HB-VTx video card with a computer 'VGA/RGB' input requires proper resolution alignment of computer systems settings.The optimum screen resolution is 1024 x 768.Screen resolution of 1280 x 768 or 800 x 600 may also be used. To check or change your computer's screen resolution, please see below.

TIP: Use high quality VGA computer interface cables to improve resolution performance.



Go to the computer DESKTOP WINDOW screen and '**RIGHT CLICK**' your mouse to bring up the above dialog box. **LEFT CLICK on 'PROPERTIES**'.

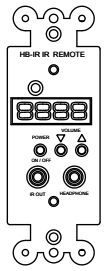
The above dialog box '**DISPLAY PROPERTIES**' will open. Choose the **SETTINGS**' menu tab in the upper right corner.



The above dialog box will appear providing settings options. Select '**SCREEN RESOLUTION**' and CHOOSE: 1280 x 768 or 1024 x 768 (optimum for HNB), or 800 x 600.

6.7 HB-IR IR Control Card: Location and Adjustment

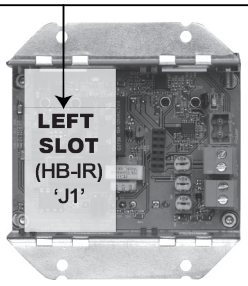
Note: HB-IR IR Remote Control card installs into the LEFT SLOT of HNB-A and the HB-2PA moves to the LEFT SLOT of HNB-B.



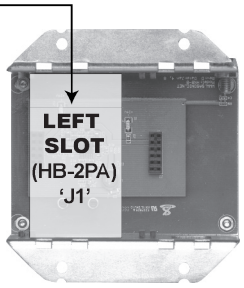
HB-IR

HNB-A
[AUDIO ONLY SYSTEM]

HNB-B
[AUDIO - VIDEO - IR SYSTEM]

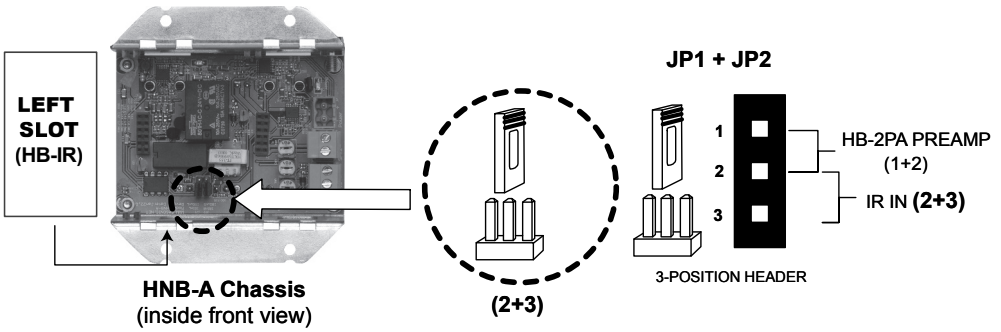


HNB-A Chassis
(inside front view)



HNB-B Chassis
(inside front view)

IMPORTANT NOTE: Whenever the HNB-A is combined with HNB-B and the IR Remote Control function is utilized; the HB-2PA Preamp module MUST MOVE to the HNB-B unit LEFT SLOT and the HB-IR IR module installs in the LEFT slot of HNB-A.

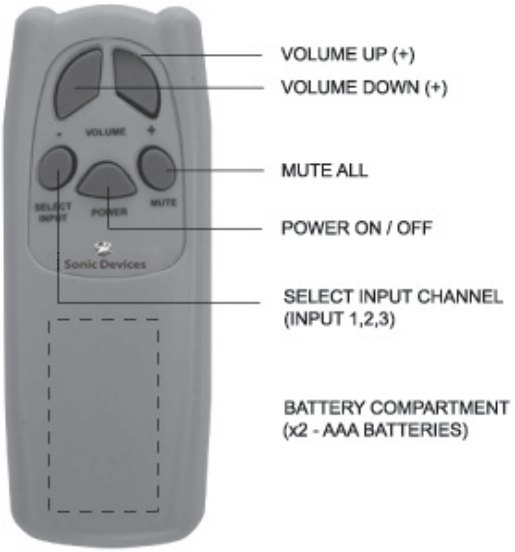


IMPORTANT NOTES:

- The jumper **MUST be in the 2+3 position of JP1 and JP2** when the **HB-IR** 'IR' card and REMOTE CONTROL are used with HNB-B.
- When IR remote control is used with an HNB system, the **HB-IR card MUST** be installed in the **HNB-A** unit in the J1 slot (**LEFT** slot).
- When the HB-IR card is used the **HB-2PA moves** to the **LEFT** slot of **HNB-B**

6.8 HB-IRRC Hand-held Remote Control

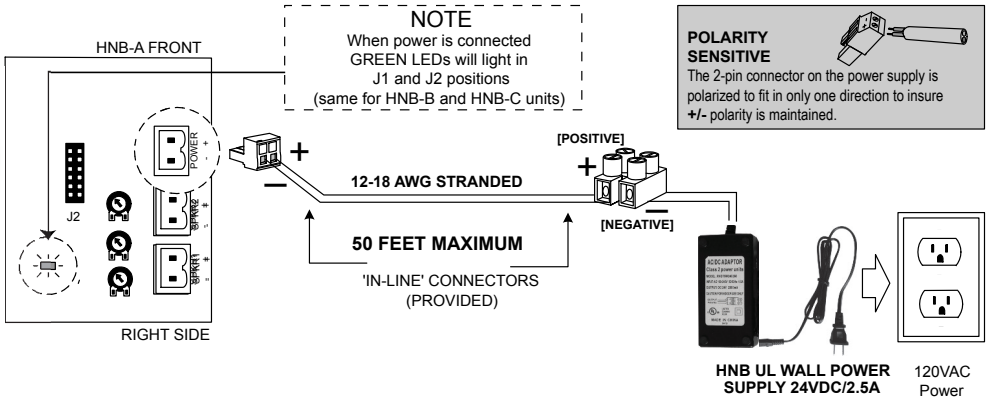
HB-IRRC hand-held remote control requires an HNB system equipped with an HB-IR 'IR' remote module. See section 6.7



6.9 HB-PS Power Supply and Cord Extension

HB-PS
Power supply
24VDC 2.5A
UL 1310 Class 2 Low Voltage / Energy Star listed

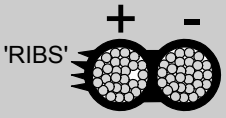
NOTE: Use UL Class 2 power supply (provided) and insure installation meets NEC and local building codes



Some applications may require that the power supply be located up to 50 feet from the HNB-A. This will require the power supply cord to be extended.

1. To extend the distance of the HNB™ power supply, use the 2-position in-line connectors (provided) to terminate additional 12-18 AWG stranded conductors. DO NOT EXCEED 50 feet.
2. IMPORTANT: Insure the correct orientation of positive (+) and negative (-) conductors prior to connection to HNB-A power input. NOTE: To help identify (+ / -) conductors, the power supply cord has Ribs, Stripe or Red marker on the (+) side; see 'TIP'.

TIP
Power supply cord jacket has RIBS, STRIPE or RED marker on the positive (+) side.



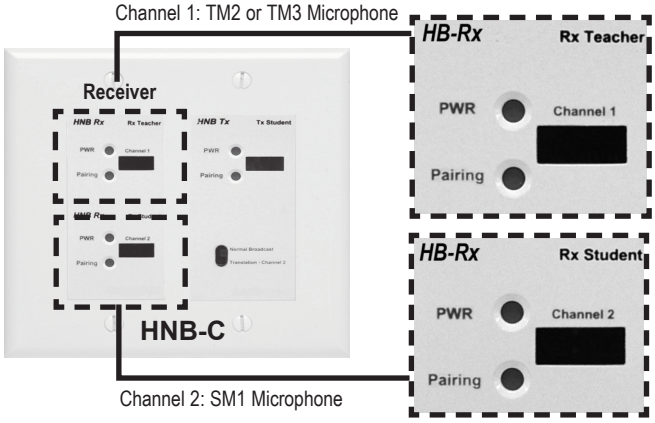
SECTION 7.0 - HNB-C Wireless Microphone Pairing, Channel Activation, and Charging

7.1 Wireless Microphones: Pairing and Power Overview

Each HB-Rx Receiver module has two (2) channels operating at independent frequencies (2.4GHz / 900MHz).

Channel 1 is for the Teacher Microphone (model TM2 or TM3).

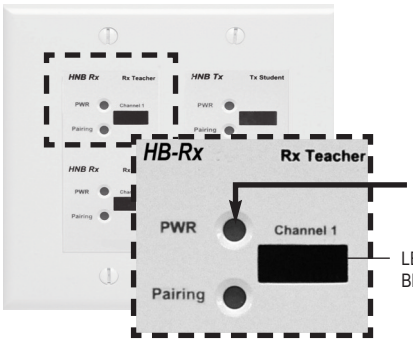
Channel 2 is for the Student Microphone (model SM1).



NOTE:

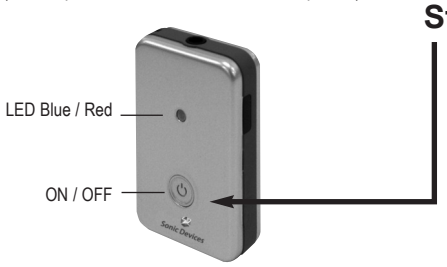
*Microphone pairing and powering is done **after** HNB-A is terminated to HNB-C. Please follow the steps outlined in 7.2 - 7.5 to activate the teacher and student microphones.*

7.2 TM2 and TM3 Teacher Microphone - Channel 1 Activation (TM1 is outlined in a separate document)



HB-Rx Receiver Module
(close-up of Channel 1 - Teacher Microphone)

Step 1: Press the power (PWR) button on the HB-Rx receiver module for Channel 1. **Power ON = Blue LED flashing.**



Transmitter
for teacher microphone (TM2 or TM3)

Step 2: Press the ON/ OFF button on the transmitter for the teacher microphone (TM2 or TM3).
ON = Blue LED flashing or Blue LED steady.

Tip: if the LED's on both units (HB-Rx and transmitter) continue flashing then proceed to Step 3 'Pairing'. If the LED's are solid (ON, but not flashing) then the units linked themselves and are ready to broadcast. Go to Step 5 'Volume'.

TM2
Teacher Mic
w transmitter

TM3
Teacher Mic
w transmitter

NOTES:

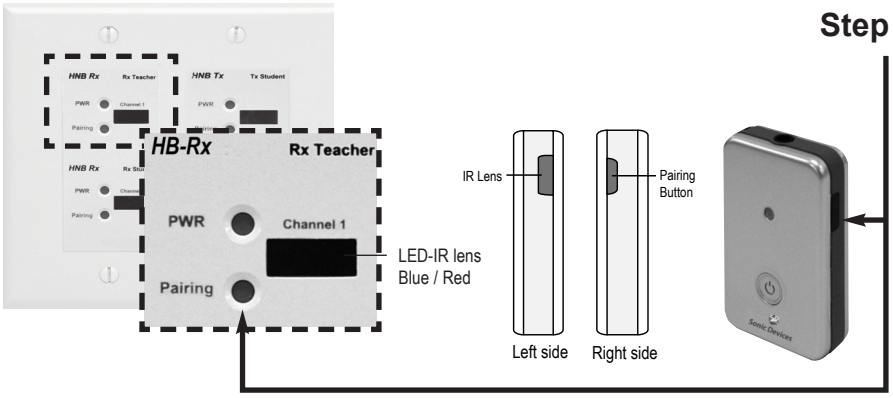
HNB-C microphones are factory 'paired' and should connect when power is pressed ON showing a STEADY blue LED condition.

ALL HNB Microphones can be 'paired' to ANY HNB-C unit in under ten (10) seconds.

HNB-C microphones should be fully charged to insure proper operation.

Important Note: Cell phones must be 1M(3') away from microphone.

7.3 TM2 and TM3 Teacher Microphone - Channel 1 Pairing



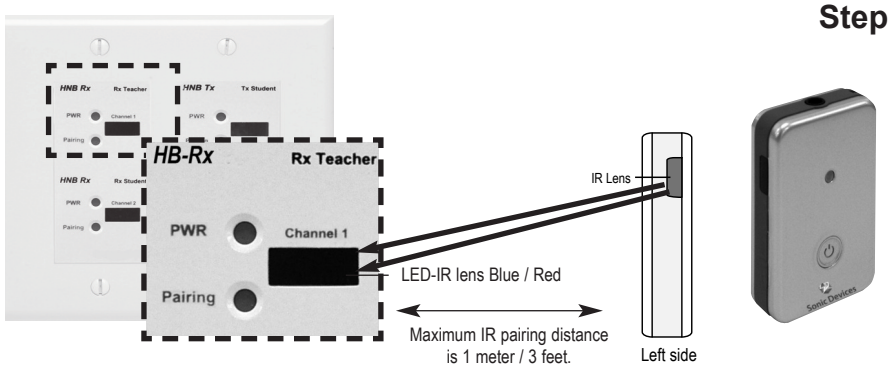
HB-Rx Receiver Module
(close-up of Channel 1 - Teacher Microphone)

Transmitter
for teacher microphone (TM2 or TM3)

Step 3: Press the 'Pairing' button for for 2-3 seconds separately on both the HB-Rx receiver module and on the Right side of the transmitter until the LED flashes alternating Red/Blue indicating units are ready to be paired.

Pairing Ready = Alternating Red/Blue steady flash

Note: Steady flash indicates that the units are looking for an ID match.



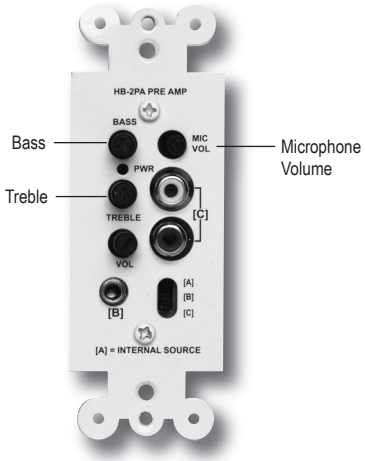
HB-Rx Receiver Module
(close-up of Channel 1 - Teacher Microphone)

Transmitter
for teacher microphone (TM2 or TM3)

Step 4: Locate the IR lens on the Left side of the transmitter unit (opposite side from the pairing button). While both units are in the pairing-ready mode; point the transmitter IR lens at the HB-Rx module LED / IR lens from a maximum distance of 1 meter / 3 feet for at least 3-4 seconds. The alternating blue/red flash sequence will commence a FAST FLASHING SEQUENCE FOR 2-3 SECONDS resulting in a SOLID blue LED condition indicating that the link is made and broadcasting can begin.

Paired = Blue LED Solid.

7.4 TM2 and TM3 Teacher Microphone - Channel 1 Volume



HB-2PA Preamp Module

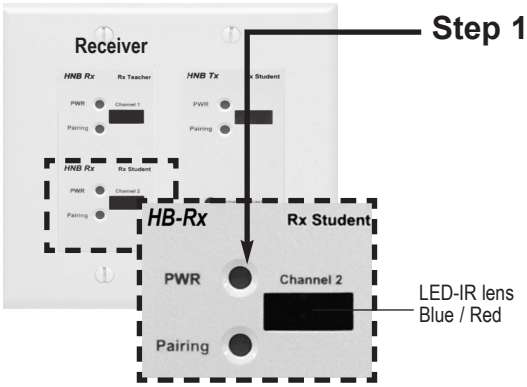
Step 5: Once units are linked and broadcasting; it is time to set microphone VOLUME, BASS and TREBLE on the HB-2PA preamplifier module to desired levels. Level adjustments are made using the convenient knobs on the HB-2PA. Additional audio gain adjustment can be made on the HB-1S Amplifier card in the HNB-A unit.

Note: All HNB microphone volumes are adjusted on the HB-2PA Preamp card using the microphone volume (MIC VOL) knob.

IMPORTANT NOTE

Refer to section 6.2 HB-2PA Preamp card adjustments for 'Duck override' of source audio when microphones are activated.

7.5 SM1 Hand-Held Student Microphone - Activation and Pairing (Channel 2)



HB-Rx Receiver Module
(close-up of Channel 2 - Student Microphone)

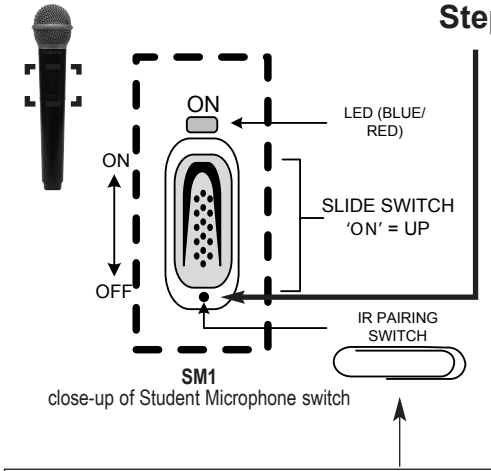
Step 1: Press the power (PWR) button on the HB-Rx receiver module for Channel 2. **Power ON = Blue LED flashing.**

NOTE: Only the SM1 microphone can operate on Channel 2.

SM1
Student Microphone

Step 2: Press the ON/ OFF SLIDE SWITCH of the SM1 student microphone to ON. **ON = Blue LED flashing or Blue LED steady.**

Tip: if the LED's on both units (HB-Rx and transmitter) continue flashing then proceed to Step 3 'Pairing'. If the LED's are solid (ON, but not flashing) then the units linked themselves and are ready to broadcast. Go to Step 5 'Volume' in section 7.4.



SM1
close-up of Student Microphone switch

Note: a paper clip or similar 'pin' type device can be used to depress the IR pairing switch.

Step 3: With the SM1 ON/OFF SLIDE SWITCH in the ON (up) position, depress the pairing switch inside the hole at the bottom of the slide switch for 2-3 seconds until the LED begins flashing blue/red. While the LED is flashing, place the SM1 microphone within 1 meter / 3 feet of the HB-Rx module IR lens which is also set in the pairing mode. In less than 4-6 seconds, both units will start a FAST FLASH mode ending in a SOLID STEADY Blue on both LEDs. The units are successfully 'Paired' and broadcasting can begin.

Paired = Blue LED solid.

Go to Step 5 'Volume' in section 7.4

NOTES:

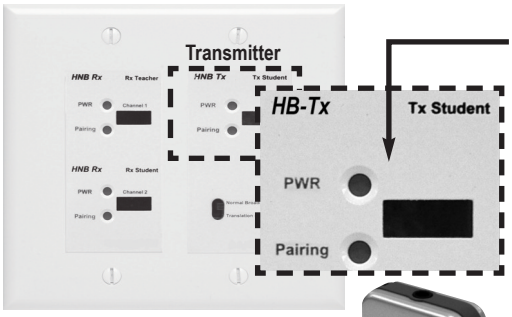
HNB-C microphones are factory 'paired' and should connect when power is pressed ON showing a STEADY blue LED condition.

ALL SM1 hand-held microphones can be 'paired' to ANY HNB-C unit in under ten (10) seconds.

Only (1) SM1 microphone can be operational per each HNB-C unit.

HNB-C microphones should be fully charged to insure proper operation.

7.6 HB-RU Assisted Listening Receiver - Activation and Pairing



HB-Tx Transmitter Module
(close-up of Power/Pairing)

HB-RU Receiver

Step 1: Press the power (PWR) button on the HB-Rx receiver module for Channel 1. **Power ON = Blue LED flashing.**

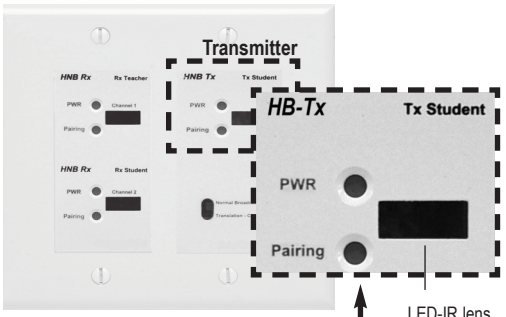
Step 2: Press the ON/ OFF button on the HB-RU Receiver. **ON = Blue LED flashing or Blue LED steady.**

Tip: if the LED's on both units (HB-Tx and HB-RU receiver) continue flashing then proceed to Step 3 'Pairing'. If the LED's are solid (ON, but not flashing) then the units linked themselves and are ready to broadcast. Go to Step 5 'Volume'.

NOTE:

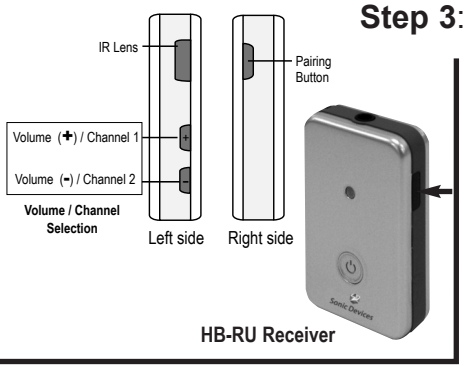
All HNB microphones ard receivers are 'paired' using 'IrDA' technology which is line-of-sight sensitive and must be accomplished within 1M / 3 feet between units.

HB-RU Receiver **includes** Stereo Headphones



HB-Tx Transmitter Module
(close-up of Power/Pairing)

LED-IR lens
Blue / Red

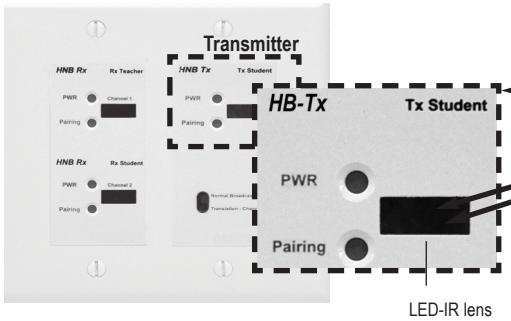


HB-RU Receiver

Step 3: Press the 'Pairing' button for for 2-3 seconds separately on both the HB-Tx Transmitter module and on the right side of the HB-RU Receiver until the LED flashes alternating Red/Blue indicating units are ready to be paired.

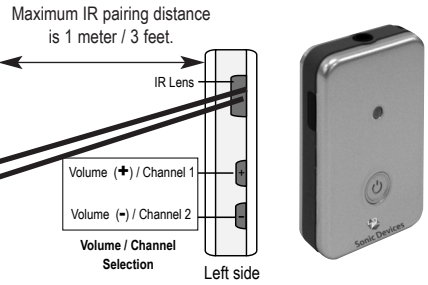
Pairing Ready = Alternating Red/Blue steady flash

Note: Steady flash indicates that the units are looking for an ID match.



HB-Tx Transmitter Module
(close-up of Power/Pairing)

LED-IR lens
Blue / Red


Maximum IR pairing distance is 1 meter / 3 feet.
IR Lens
Volume (+) / Channel 1
Volume (-) / Channel 2
Volume / Channel Selection
Left side

HB-RU Receiver

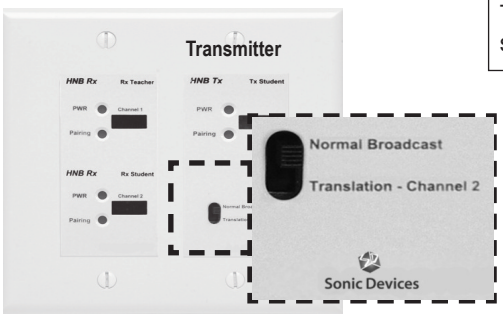
Step 4: Locate the IR lens on the Left side of the HB-RU Receiver unit (opposite side from the pairing button). While both units are in the pairing-ready mode; point the Receiver IR lens at the HB-Tx module LED / IR lens from a maximum distance of 1 meter / 3 feet for at least 3-4 seconds. The alternating blue/red flash sequence will commence a FAST FLASHING SEQUENCE FOR 2-3 SECONDS resulting in a SOLID blue LED condition indicating that the link is made and broadcasting can begin.

Paired = Blue LED Solid.

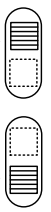
Step 5: The HB-RU Volume (+/-) buttons are software defined and provide BOTH volume and Channel selection. Volume is achieved with momentary (1) second or less 'taps'. Channel 1 and Channel 2 selection is achieved via a 'PRESS AND HOLD' operation for (5) seconds.

7.7 HB-RU Assisted Listening Receiver - Normal Mode - Translation Mode

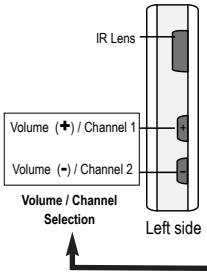
The slide switch for NORMAL BROADCAST mode is in the UP position. The slide switch for TRANSLATION - CHANNEL 2 is in the DOWN position. For Normal and Translation modes, both Channel 1 and Channel 2 are broadcast to the HB-RU unit simultaneously. All HNB-A audio sources are transmitted to the HB-RU.



HB-Tx Transmitter Module
(close-up of slide switch)



Step 1: Once system is operational, place front slide switch on HB-Tx card in DOWN position to **Translation - Channel 2** mode. Note Channel 2 is always the SM1 hand-held microphone. When slide switch is placed in this position; the SM1 microphone output is MUTED (OFF) from the overhead speakers connected to HNB-A and its output is only transmitted to the HB-RU Receiver.

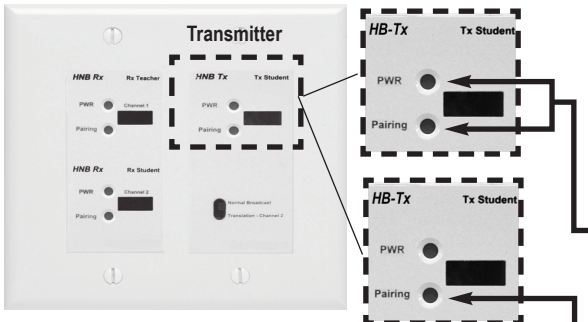


HB-RU Receiver

Step 2: To select Channel 1 (Teacher microphone: TM1, TM2, TM3) or Channel 2 (Student microphone: SM1, PRESS AND HOLD for (5) seconds the **Volume (+) for Channel 1** or the **Volume (-) for Channel** 2.

7.8 Final Test for HNB-C Wireless When using HB-Tx Transmitter

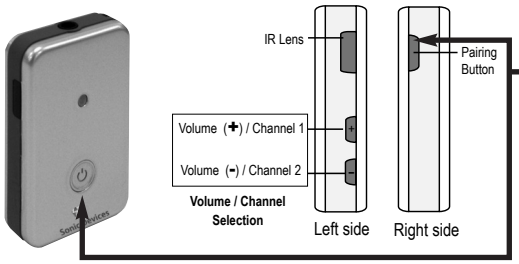
FINAL INSTALLATION CHECK OUT FOR HNB-C WIRELESS WITH HB-Tx. If after normal operation of HB-Rx connected microphones, an intermittent noise, or 'drop out' is noticed AFTER the HB-Tx is installed and operating; it is recommended to change the HB-Tx 'ID' frequency as shown below in steps 1-3. Once 'ID Change' is accomplished TM Series and SM1 microphones should operate in Normal mode.



HB-Tx Transmitter Module
(close-up of Power/Pairing)

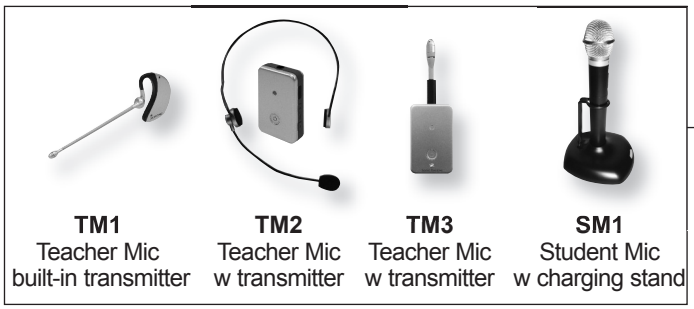
Step 1: In the power off mode for the HB-Tx module, PRESS BOTH POWER AND PAIRING button down for 3-5 seconds until the LED starts a steady RED flash rate.

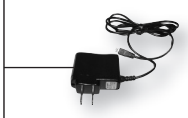
Step 2: PRESS PAIRING button on HB-Tx module for 2-3 seconds to achieve FAST 'PAIRING ACTIVE' rate on the LED.

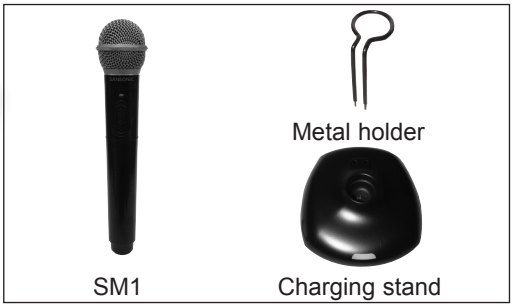


Step 3: Turn ON the HB-RU Receiver and then press the PAIRING' button on the HB-RU for for 2-3 seconds to achieve 'FAST' FLASH rate on the LED and face the HB-RU towards the HB-Tx module LED window lens. Note: Both units must be within 1M / 3ft. Once channel ID is complete, the LED on both HB-Tx and HB-RU will begin a 'STEADY BLUE' state. See section 7.3

7.9 Microphone Charging




Battery charger w
6v Power supply



All HNB microphones: TM1, TM2, TM3 and SM1 use a battery charger with 6V wall power supply included. The power supply is UL / Energy Star rated and plugs into a standard 120VAC outlet.

All HNB microphones and receivers have a FAST charging time; 50% recharge in (30) minutes, 100% FULL recharge in (90) minutes (nominal). During charging front LED for TM1, TM2, TM3 and HB-RU receiver will begin as Bright Green and when fully charged will 'dim'. This is normal. The units will operate for 5-6 hours of continuous talk time when fully charged.

SM1 Charging Stand Assembly
Student hand-held microphone battery charger requires assembly of metal holder into the charging base. Simply insert the metal holder and into the base allowing the microphone to be placed into the holder and supported vertically inside the base. The 6V wall charger power supply terminates to the USB mini jack on the base. When fully charged in (90) minutes the SM1 will operate for 6-8 hours of continuous talk time. Charging stand has LED charging status colors of:
Blue=ON, Red=Charging, Green=Fully Charged.

SECTION 8.0 - HNB-A + HNB-B + HNB-C WARRANTY

Please read the following terms and conditions, as they are affected by the installation conditions as well as SonicDevices obligations and conditions which must be met to activate them. SonicDevices does not assume nor does it authorize any person to assume or extend on its behalf any other warranty obligation or liability.

SonicDevices *Digital Audio Mixer Amplifier Model HNB-A, HNB-B, HNB-C and all related accessories are* warranted for a period of three (3) years from the date of shipment to the customer. During such warranty period the electronic unit shall be free from defects in materials or factory workmanship so that the electronic unit shall substantially conform to the SonicDevices published specifications. The warranty applies to all first quality products. This limited warranty is subject to further conditions as outlined below.

All electronic units shall be installed and used in accordance with SonicDevices specifications in effect at the time of installation.

SonicDevices will not be responsible for defects caused by improper or unreasonable use, water intrusions, lightning, or malfunctions when electronic units have been modified or operated in excess of their rated capacities, altered, serviced, or installed in an other than workman-like manner or industry accepted practices.

This limited warranty is void if the label bearing the electronic units date of manufacture and serial number is removed or otherwise defaced to the point of not being legible.

You must notify SonicDevices of any electronic unit failure covered by this warranty within (30) days of first observation of failure by writing (electronic or paper) to the Customer Service department at: SonicDevices, 9950 E. Baldwin Place, El Monte, CA 91731 (T) 626-454-8203, (F) 626-466-1338 www.sonicdevices.net.

After an inspection has been conducted by SonicDevices or its authorized Representatives, and the validity of the return has been verified, a written Return Authorization (RA) to return must be issued by SonicDevices prior to any return. Electronic devices returned and found to be defective, in SonicDevices sole judgment, will either be replaced (replacement products may be remanufactured or reconditioned devices) or repaired without charge. The replaced or repaired electronic unit is warranted for the remainder of the original warranty period.

The foregoing constitutes the entire obligation of SonicDevices, and there are not other warranties expressed or implied, including any warranty or merchantability or fitness for any purpose whatsoever. Liability is limited to the above, and SonicDevices, shall in no event be liable for any incidental or consequential damages other than to replace or repair the electronic device(s) itself.

Please note: Some jurisdictions do not allow exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the above limitation or exclusion may not apply to you.

Reference to SonicDevices in this section shall mean, for the United States: SonicDevices, 9950 Baldwin Place, El Monte, CA 91731.

SECTION 9.0 - HNB-A + HNB-B + HNB-C TROUBLESHOOTING GUIDE

Please follow these tips before calling the Sonic Devices hotline for assistance:

1) Read and review all sections and follow all instructions in this manual.

2) Before terminating speakers to SPKR1 (J3-Right) + SPKR2 (J4-Left), verify that all wiring is free from shorts, opens, crosses or ground problems. Please verify polarity of speaker wiring (+/-).

3) After connecting power supply (J5); verify that LED's have lit on the front HB card panels and backplane in J1 and J2 positions for both HNB-A and HNB-B (Green LED). If there is no power LED light on HNB-B; verify wiring in the RJ45 to meet EIA-568B per section 4.7 and 4.8 (power on pins 3+6). If there is no light and AC power source is confirmed; verify that polarity (+/-) wiring is correct with Red or Ribbed wire as (+) positive. Use front panel soft button and IR remote control to cycle power On/Off.

4) If no Override page is heard and input audio sources are not muted during "master-override" page; verify wiring termination polarity (+/-) to the MO connector and insure 'Volt Sens' POT on rear is adjusted correctly and front MO-IN 'orange' LED lights.

5) If after power and system terminations have been made and no audio is detected, insure volume gains are adjusted properly and that all speakers are of the proper impedance and/or have correct impedance-matching transformers (25V or 70V / see HNB-70V2X section 5.2) installed.

6) If after power, speakers and audio sources are properly connected and no audio is heard over the speakers please insure the HB-2PA Preamp front slide switch is located in the correct position (A,B,C) corresponding to the audio source input (A = internal dockable connector, B = 3.5mm front jack, C = RCA front jacks).

7) If audio level is low or lower than expected, please check the HB-2PA Preamp card (in HNB-A or HNB-B) and insure the JP1 and JP2 jumpers are in the proper position: JPI + JP2 terminated (both terminals) when NO HNB-C wireless is connected to the HNB-A or when HNB-C is connected to HNB-A, both jumpers should be removed or only terminated on one pin. Proceed to normal volume audio adjustments.

8) If video signal / picture does not appear at AV projector, please verify LED's are "on" (Green) at the HB-VTx front panel and HB-VRx receiver which includes power and signal (see section 6.3 to 6.6). Insure all CAT5e/RJ454 terminations meet EIA-568B (section 4.7 and 4.8) and terminations of VGA, S-video and Composite video are made properly at the AV projector. Finally, insure the AV Projector and source are transmitting and set to compatible source and resolution (see section 6.6). NOTE: Image quality such as; Color, Brightness, Focus, Blurring are most likely adjustments in the projector, computer and or video source.

9) It the HB-IRRC remote control does not function please check the AAA batteries (x2) to insure a full charge. Also check to insure direct sunlight or strong florescent lights are not interfering. Reminder: The IR remote control will not operate beyond (50) feet.

10) If any of the HNB–C RF microphones or receivers experience intermittent noise or drop out please check to insure batteries are charged. Please remember HNB–C RF coverage is designed to perform without interruption or problem within a 40' x 40' x 10' (typical) room space and may work well beyond this depending on room architecture, construction and line of sight.

11) If any of the HNB–C RF microphones or receivers do not show connection or have continuous flashing Blue LED please insure units are properly 'paired' (refer to sections 7.1 to 7.6).

12) If after successful HNB-C wireless install and both TM Teacher Microphones and SM1 Student Hand held microphone are confirmed to be performing properly (without noise, drop out with acceptable coverage throughout the room) and then after installing the HB-Tx transmit module in the RIGHT SLOT of HNB-C with corresponding HB-RU receiver/headphones you now notice intermittent noise or drop out of the microphones please refer to section 7.8 and follow the procedure changing the ID Frequency of the HB-Tx / HB-RU units. After following this procedure all wireless microphones should return to normal operation.

13) If after installing the HNB-C wireless unit with the HB-Tx card and you notice the SM1 hand-held microphone is not transmitting audio to the HNB-A overhead connected speakers please check to insure the front panel slide switch on the HB-Tx module is in the 'UP' position for Normal Broadcast mode. Once you move the slide switch to 'Normal Broadcast' the SM1 microphone will be heard over the room speakers.

14) If you continue to experience difficulty, please call SonicDevices at 626-454-8169 or email:

tom@sonicdevices.net
james@sonicdevices.net